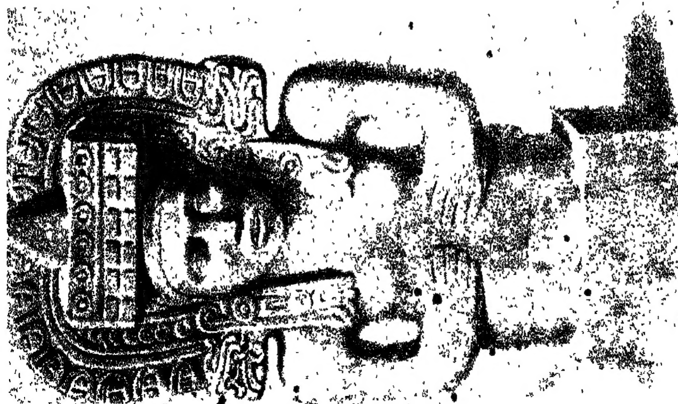




THE JOURNAL

OF THE

ROYAL GEOGRAPHICAL SOCIETY

LONDON.

VOLUME THE SEVENTH.

1837.

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JOHN MURRAY, ALBEMARLE-STREET.

MDCCCXXXVII

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Stamford Street.

CONTENTS OF VOLUME VII.

ANALYSES, &c.

MISCELLANEOUS.

*** The Binder must cancel the last leaf of Part I. (193-94), and put sheet P after page 192.

LIST OF ILLUSTRATIONS TO VOL. VII.

ERRATA.

Vol. VI.

Page 337, line 18, *for* 4h. 16m. 56s. *read* 4h. 20m. 56s.
—— 338, — 9, *for* 11h. 37m. 12s. read 31h. 36m. 6s. *East.*
—— 339, — in variation column, *for* degrees and minutes, *read* degrees and *tenths* of a degree throughout.

Vol. VII.

—— 1, — 6, *for* Teotihuachan *read* Teotihuacan.
—— 19, 6th from bottom, *for* Toltecalt *read* Toltecatl.
—— 103, 2d. *for* See, *read* Sea.
—— 202, 4th from bottom, *for* 18° *read* 81°.
—— 299, 4th—————— *insert* Mary's Hope, high water at full and change 5h. 40m. Rise of tide at Springs 8½, at Neap 3½ feet. Variation 4° ¼ E.

Royal Geographical Society.

1837.

AT THE

ANNUAL GENERAL MEETING, May 15, 1837,

The following Report from the Council was read:—

The Council has again to congratulate the Society upon the steady increase in the number of its members, affording a gratifying proof, it is willing to believe, of the interest felt by the public in the promotion and encouragement of geographical science.

Thirty-nine new members have been elected during the past year; and the Society now consists of 545 members, exclusive of foreign, honorary, and corresponding members.

Yet while recording the fact of an increase of numbers, the Council cannot be unmindful that the Society has to lament the loss of many valuable members, and especially of him, whose melancholy death in Northern Africa must be fresh in the remembrance of every member of the Society;—young, zealous, and enterprising, the traveller had surmounted all the difficulties opposed to him in Marocco, in Sús, in Wádí Nún, and had even traversed half the desert which separated him from Timbuctoo, when he fell a victim to the treachery of the faithless Arabs; and the name of Davidson must now be added to those of Hornemann, Park, Ledyard, Burckhardt, Laing, Clapperton, and Lander, as the most eminent amongst those who have sacrificed their lives in the cause of African discovery.

In our own country, we cannot pass unnoticed the death of William Marsden, Esq., a zealous and valuable member, who took a warm interest in our welfare, and devoted much time,

during a long and active life, to the study of ethnography, an important and, in this country, too much neglected branch of geography. A donation of nearly a hundred volumes to the library of the Society will perpetuate his name as one of our most liberal friends and benefactors.

In common with all those who are interested in one of the most important branches of geography, we have to record the almost irreparable loss of Captain James Horsburgh, the Hydrographer to the East India Company, to whose joint industry, skill, and perseverance the nation is so deeply indebted for our present knowledge of all the maritime regions of the Eastern world.

We have also to regret the loss of a distinguished foreign honorary member, Professor Frederick Hoffmann, who died at an early age. He is perhaps better known by his geological labours; but his great map of North-western Germany, and his work on the Orography and Geognosy of the same district, published in 1830, give him a high claim as a geographer.

Within these few days, also, the Council has learnt that a corresponding member of the Society, Don Ignacio Iberri, a General of Engineers in the Mexican Service, has fallen a victim to his exertions, while exploring the site of some ancient remains lately discovered in the mountains near Jalapa.

Finances.—The state of the finances, the details of which are annexed, continues satisfactory. The expenditure for the past year has been considerable, in consequence of 490*l.* having been paid towards the expedition into British Guayana; 350*l.* towards that in Southern Africa; and 100 guineas for engraving the die of the Royal Medal; yet it is gratifying to add that no necessity exists for touching upon the capital stock invested in the funds.

Publications.—The Journal of the Society for the year 1836, as in former years, has been published in two parts, and the first part of that for 1837 is now laid on the table. The demand for it by the public continues, and the marked increase in the sale of the last volume, having exceeded 400 in the space of six months, besides the 600 copies issued gratuitously to members,

would seem fully to justify the decision come to by the Council, that the illustrations in future should be engraved on copper; and that, however slight the sketch map of a country in illustration of a memoir, its execution should be confided to our most able artists to ensure accuracy as far as the information we possess will enable us to do so; a small increase of expense will, of course, be incurred, but the object gained of never giving currency to any but the most perfect maps our means will supply, more than compensate for any such consideration.

Nor can the Council omit to record its testimony to the able and liberal assistance it has received in this department from Mr. John Arrowsmith, without whose experience and often gratuitous co-operation it could not have carried its wishes into effect.

The first edition of the second volume of the Journal having been exhausted, while a demand still continues for it both by the public at large and by new members joining the Society, who are desirous of procuring complete sets of the Society's Transactions, the Council has directed it to be reprinted, and it is now ready for delivery.

Mr. Macdougall's Translation of Captain Graah's Account of Danish Discoveries on the East Coast of Greenland, published at the expense of the Society, is now laid on the table. The delay that has occurred in its publication, owing to the melancholy death of the translator, has enabled the Council to take advantage of the kind offer of Captain James Ross to add some notes to the work, which, from his long experience on the coast of Greenland, will doubtless much enhance the value of the book. Members may now obtain it, *gratis*, at the Society's apartments.

The Society's other publication, namely, the Grammar of the Cree Language, by Mr. Howse, which was undertaken in conjunction with the Church Missionary Society, advances slowly (as, indeed, from the nature of the work it may be expected) towards completion. It will probably appear during the present year.

His Majesty's Donation.—The royal premium for 1836 has been awarded by the Council to Captain Robert Fitz Roy, Royal Navy, for his recent survey of the coasts of South America,

TREASURER'S BALANCE SHEET, 1836.

Dr.

	£.	s.	d.
Balance in hand, January 1st	1109	14	1
Entrance of 39 Members at 3*l*.	117	0	0
Composition of 19 Members at 17*l*.	323	0	0
Subscription of 208 Members at 2*l*.	416	2	0
Arrears paid up	48	0	0
Dividends on Stock (4800*l*. at 3½)	168	0	0
Books sold in 1835	112	2	0
	£2,293	18	1

	£.	s.	d.
House Rent	110	0	0
Salaries	316	14	0
Printing Journal, Vol. V.	248	9	0
Illustrations for Journal, Vol. V.	85	0	0
——— Vol. VI. Part. I.	38	10	3
General printing	51	16	0
Royal Premium	52	10	0
Die for Medal and 2 Silver Medals	109	12	0
Guayana Expedition	490	0	0
South African Expedition	356	12	0
Collector's Salary	21	0	0
Graah's Charts of Greenland	60	10	0
Printing Cree Grammar	30	0	0
Books, Maps, and Bookbinding	101	18	0
Stationery	38	9	3
Firing and Lights	26	10	6
Porterage, carriage of Parcels, &c.	37	12	7
Postage of letters	15	12	6
Expenses of Evening Meetings	21	3	9
Furniture and repairs in rooms	16	7	10
Attendance and wages of Housekeeper	22	14	4
Insurance and Advertisements	3	10	0
Transfer of Stock	6	3	6
Balance in hand	33	1	7
	£2,293	18	1

The above accounts for 1836 have been examined by us and found correct.

(Signed) { B. FRERE,
J. TREMAYNE RODD.

(Signed) JOHN BIDDULPH.

ESTIMATE FOR 1837.

Dr.

				£.	s.	d.
Balance in hand, 1st January				33	1	7
Probable amount of subscriptions as last year:—						
Entrance of 39 members	£117	0	0			
Composition of 19 members	323	0	0			
Subscription of 208 members	416	0	0			
				856	0	0
Arrears likely to be recovered				150	0	0
Dividends on stock				168	0	0
Sale of Journal				100	0	0
Royal Premium				52	10	0
				£1,359	11	7

Cr.

	£.	s.	d.
House Rent	110	0	0
Salaries	300	0	0
Printing Journal	290	0	0
Illustrations to Journal	110	0	0
Expense of Guayana expedition	100	0	0
Reprinting second volume of Journal	100	0	0
Books and Maps	100	0	0
Printing Cree Grammar	30	0	0
Royal Premium	52	10	0
Collector	21	0	0
Office expenses, including firing, lights, refreshments at meetings, attendance, messages, postage, &c.	100	0	
	£1,313	10	

JOHN WASHINGTON.

ACCESSIONS TO THE LIBRARY,

15th MAY, 1837.

Title of Book.	*Donors.*
ACADEMIE des Sciences, Comptes rendus des séances de l', Nov. 1836. May, 1837	L'ACADEMIE DES SCIENCES A PARIS.
AFRICA, Egypt, and Syria, Travels in, from 1792 to 1798. By G. W. Browne, Esq. 1 vol. 4to. 1806.	
——, (South), Narrative of an Expedition to explore the River Zaire or Congo, in 1816. By Captain Tuckey, R.N. 1 vol. 4to. 1818.	
——, Report of the Expedition for exploring Central. By Dr. A. Smith. Pamphlet. 8vo. 1836	CAPTAIN J. E. ALEXANDER.
AFRIQUE, Esquisse général de l'. Par M. D'Avezac. 1 vol. 12mo. 1837	M. D'AVEZAC.
ALEPPO to Jerusalem. Journey from, in 1697. By H. Maundrell. 1 vol. 8vo. 1810.	
ALGERI, Cenni Statistici e Geografici della Reggenza di. By Gräberg de Hemsö. Pamphlet. 8vo. 1830	COUNT GRABERG DE HEMSO.
ALMANAC, American, for 1837. 1 vol. 8vo.	THE EDITOR OF THE AMERICAN ALMANAC.
——, the Nautical, from 1767 to 1836. 37 vols. 8vo.	MRS. MARSDEN.
ALMANACH, Geographischer, für das Jahr 1837. Von H. Berghaus. 1 vol. 8vo.	
ALMANAQUE, Nautico y Efemérides Astronomicas para el año de 1838. Madrid	DON JOSE SANCHEZ CERQUERO.
AMAZIRGHS, Remarks on the Language of the. By Count Gräberg de Hemsö. Pamphlet, 8vo.	COUNT GRABERG DE HEMSO.
AMERICA Septentrional, Nueva Historia general dela. Por el Cavallero Lorenzo Boturini Benaduci. 1 vol. 8vo. Madrid, 1746.	CAPTAIN VETCH, R.E.
—— Central, Excursions in, by O. W. Roberts, in 1817-22. 1 vol. 12mo.	
AMERICAN Journal of Science—Silliman's (*in continuation*).	
—— Review, the North. Nos. 92 and 94.	
AMERIKA, Centraal. Door J. Haefkens. 1 vol. 8vo. 1832.	
—— Report of a Geological reconnaissance made in 1835 in the United States of. By G. W. Featherstonhaugh, Esq. 1 vol. 8vo.	G. W. FEATHERSTONHAUGH, ESQ.
ANNALEN der Erd-Völker-und Staatenkunde. Von Dr. H. Berghaus, to Oct. 1836 (*in continuation*).	
ANNALES des Voyages, to March, 1837 (*in continuation*).	

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Annali di Geografia, e di Statistica. By Count Gråberg de Hemsö. 2 vols. 8vo. 1802	Count Graberg de Hemso.
Antarctic Discovery. A Letter to the President of the Royal Geographical Society on. Pamphlet, 8vo.	Captain Washington, R.N.
Antologia, Thirteen Articles contributed to the. By Count Gråberg de Hemsö	Do.
Arabia, Voyage to. By M. La Roque. 1 vol. 12mo. London, 1730	Sir Woodbine Parish.
Architects, British Transactions of the Institute of. Vol. I. Part I. 4to. 1837	The Institute of British Architects.
Arctic Ocean, Narrative of a Journey to the Shores of the, in 1833–4–5. By R. King. 2 vols. 8vo. 1836	Dr. Hodgkin.
——— Arguments in favour of a new Expedition to the Shores of the. By R. King, Esq. Pamphlet, 8vo.	Rich. King, Esq.
Arts, Manufactures, and Commerce, Transactions of the Society of. Vol. 51. 1837 (*in continuation*)	The Society of Arts, &c.
Asia, Berghaus'. Parts 2 and 3.	
—— Minor, Armenia, and Koordistan. Tour through, in 1813–14. By J. M. Kinneir. 1 vol. 8vo. 1818.	
Asiatic Researches. Vol. 20. Part II. Calcutta. 1836	The Asiatic Society of Bengal.
——— Society of London, Journal of. Nos. 6 and 7 (*in continuation*)	Royal Asiatic Society of London.
——— Journal. July to December, 1836.	
——— Society of Bengal, Journal of the, to Sept. 1836 (*in continuation*).	
Asien, Die Erdkunde von. By Von Carl Ritter. Vol. 4. Parts 5 and 6.	Professor Carl Ritter.
Astronomical Society. Memoirs of the Royal, vol. 9. 4to. 1836 (*in continuation*)	The Royal Astronomical Society.
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British Association for the Advancement of Science, 5th Report of. 8vo. 1836	The British Association.
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British Museum, Letter on the better management of it. By J. Millard, Esq.	John Millard, Esq.
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GEOGRAPHICAL Society of Berlin, Third Annual Report of, by Professor Carl Ritter	PROFESSOR CARL RITTER.
GEOGRAPHIE, Bulletin de la Société de, à Paris, for 1836	LA SOCIETE DE GEOGRAPHIE A PARIS.
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GEOLOGICAL Society of London, Transactions of the, Second Series. Vol. 4.	THE GEOLOGICAL SOCIETY.
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———, Address delivered at the Anniversary Meeting in February, 1837, by the President, Charles Lyell, Esq.	CHAS. LYELL, ESQ.
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ITALIA, Statistica d'. Nos. 1, 2, and 3, by Count Serristori. Florence. 1836.	
JAPAN, Nippon Archiv zur Beschreibung, von. P. F. von Siebold. Leyden. 1832	
LITERARY Gazette, to May, 1837 (*in continuation*) .	THE EDITOR.
LUNAR Distances, Tables for correcting, by J. G. Curtis, R.N.	J. G. C. CURTIS, R.N.
MAGALHAES, Roteiro da Viagem de, 1 vol. 8vo. Lisbon. 1836	COUNSR. J. J. DA COSTA DE MACEDO.
MAGNETICAL Observations made by Captain Back during his late Arctic Expedition, discussed by S. H. Christie, Esq. 4to. 1836	S. H. CHRISTIE, ESQ.
MALAYAN Family, Memoirs of a, by W. Marsden, Esq. 1 vol. 8vo. 1830	MRS. MARSDEN.
———— Language, a Grammar and Dictionary of the, by W. Marsden, Esq. 1 vol. 4to. 1812.	DO.
MAROCCO, Travels in Spain and, in 1785, by Col. Keatinge. 1 vol. 4to. London. 1816.	
MAROKKO, Das Sultanat Mogh'rib-ul-Aksá, von J. Gråberg de Hemsö, in German, by Alfred Reumont. 1833. 1 vol. 8vo.	COUNT GRABERG DE HEMSÖ.
MAURITIUS, Sixième Rapport Annuel sur les travaux de la Société d'Histoire Naturelle de l'Isle de, par M. Desjardins.—Pamphlet. 8vo. 1835	LA SOCIETE D'HISTOIRE NATURELLE.
MEDICO-Botanical Society, Address of the President, January 16, 1836.—Pamphlet. 8vo.	THE MEDICO-BOTANICAL SOCIETY.
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Moscou, Tableau Statistique, Géographique, &c., de la Ville de, par J. H. Schnitzler.—Pamphlet. 8vo. 1834 .	Colonel Jackson.
Modern Traveller, by J. Conder. 31 vols. 12mo.	
Nações, Ultramarinas, Collecção de Noticias para a Historia e Geografia das, por J. J. da Costa de Macedo. 5 vols. 8vo.	Counsellor J. J. da Costa de Macedo.
Napoleon in Council, by Baron Pelet, translated by Captain Basil Hall, R.N. 1 vol. 8vo. 1837 . . .	Captain Basil Hall, R.N.
Nautical Memoirs and Tracts, by Alexander Dalrymple, Esq. 8 vols. 4to. 1836	Mrs. Marsden.
Nautical Magazine, to May, 1837 (*in continuation*) .	
Observations du Pendule invariable exécutées dans un Voyage autour du Monde, in 1826-7-8-9, by Rear-Admiral Lütké. 1 vol. 4to. 1836 . . .	Admiral Lutke.
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Reise um die Erde, in 1828, 1829, and 1830. von Adolph Erman. 1 vol. 8vo. 1st Part. Berlin. 1833.	
—— Physikalische Beobachtungen. 1st vol. 2nd Part. 1835.	
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BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

Art. I.—*On the Monuments and Relics of the Ancient Inhabitants of New Spain.*—Communicated by Captain Vetch, Royal Engineers, F.R.S.—*Read Nov.* 28, 1836.

Had none of these been preserved to our days, the study of the history and condition of the ancient inhabitants of New Spain would have deserved as little interest and attention as the history and condition of the ancient inhabitants of New Holland or Van Diemen's Land. The case, however, is far otherwise, for the pyramids of Teotihuacan, Cholula, Xochicalco, and Papantla, and the edifices of Mitla and Palenque, are erections of a magnitude to indicate they could *only* have been constructed in a country teeming with population, and submitted to a well organized government.

If we take, for example, the pyramid of Cholula, we learn from Humboldt, that it stands upon a square base, each side of which is about 480 yards, while the height, in its original state, was probably not short of 180 feet, or one-eighth of the base line; and if we next assume that the slopes were formed at an angle of 45°, and that this truncated pyramid was divided into its four stages or stories, by means of three terraces, each 30 yards in breadth, we shall find the solid contents of the structure to amount to the enormous quantity of 7,146,000 cubic yards; and if the writer is to judge of this pyramid from those of Teotihuacan, the whole must have been cased in a smooth but hard coat of stucco or cement, so that without taking into account the edifices which adorned the summit and other parts, some estimate may be formed of the labour and expense bestowed on this vast pile, and at the same time we are led to conclude, that the people which could spare hands for such an erection, must have been numerous, and that the nation which submitted to so heavy a tax, must have been under an entire subjection to order and government; and, on the other hand, that the government must have possessed great au-

thority, and great means, and that it was capable of long continued exertion.*

Robertson, in his History of America, but partially informed on many points, eager to generalize, and to adopt a theory of the passage of mankind from savage to civilized life, is constantly misjudging and depreciating the claims of the original Americans to an attainment of the arts and condition of civilized life, and will hardly allow that any monuments exist of the works of man deserving of notice; and though under the necessity of admitting the pyramid of Cholula, he describes it as nothing more than a mount of solid earth—but what more remains of Babylon? and where shall we find such another artificial mount of solid earth?

With respect to those monuments which have just been enumerated, it is to be observed, that they were not erected at or near the epoch when the country was first visited by the Spaniards, but at that time (with the exception of the pyramid of Cholula) they were then in the same ruined and deserted state as we now find them; and the time and manner of their destruction and abandonment seem as much wrapt in obscurity as those of their origin and construction, notwithstanding the annals of the Alcohuan empire are considered to reach to the end of the twelfth, or beginning of the thirteenth century.

It is therefore very important to draw a great line of separation between these more ancient monuments of New Spain (believed to have been erected under the Toltec empire) and those monuments erected in or near the city of Mexico, from the period between its foundation in 1325, and its destruction by Cortes in 1521. These last, belonging exclusively to the tribe of Astecs, or Mexicans, may be described as Astec monuments. I have not been able to understand why Baron Humboldt describes the palace of Mitla, and other relics in the south of New Spain as Astec monuments, since it is most reasonable to suppose that such were not only constructed, but also in ruins before the Astecs had carried their power and conquests so far south. As however the Astecs continued for one century after the foundation of their capital, but an obscure tribe of the Alcohuan empire, of which Tescuco was the capital, the term Alcohuan would better express the monuments of Anahuac, from the twelfth century to the arrival of the Spaniards.

The Toltec and Alcohuan monuments, though belonging to ages far apart, yet present the curious coincidence of both abounding in pyramidal erections, and though the origin and destruction

* Major Rennell has adopted 231 yards as the length of the side of the base of the great pyramid of Ghizeh, and elsewhere he gives his opinion that the monarchs who erected the pyramids of Egypt must have possessed greater resources and power than what they derived from that country alone.

of the pyramids of Teotihuacan are alike lost in the remoteness of their antiquity, the same species of edifices nevertheless continued to be erected up to the date of the Spanish invasion; and this fact is interesting, in seeming to show that the second period of refinement and prosperity in Anahuac was erected upon, or had grown out of the vestiges of the arts and institutions handed down from the first epoch. It has been stated that the great pyramid of the city of Mexico was formed on the model of those of Teotihuacan, but if the descriptions and drawings of that of Mexico can be relied on, it would *not* be easy to conceive pyramids less alike than these are. But the fact is, the Alcohuans and Astecs continued to build temples in the form of pyramids, because they maintained doctrines, and creeds, and institutions modelled on those of the Toltecs, who first erected temples of that form.

Between the more ancient and the more modern pyramids of New Spain, there is, however, a vast difference in point of size. The first being of the most imposing dimensions, whereas the latter would not particularly arrest attention. If we are, therefore, allowed to form an estimate of the power and civilization of the Toltecs, compared to that of the Astecs, from the character and design of their respective monuments, then we must conclude that the Toltecs had attained a far greater degree of power, wealth, and knowledge of the arts, than that acquired by the Astecs, under Montezuma the Second.

My object, however, at present, is not to investigate the history of the Toltec and Alcohuan people or empires, but rather to show that the monuments of the first are of a nature and epoch to excite a strong interest, and deserving of being studied. It is, indeed, to be urged, on the other hand, that huge pyramids of solid earth are no great proofs of advancement in the arts of civilized life; I have, however, endeavoured to show what these do appear to prove. But amongst many other indications of progress in art and science, the most convincing fact will probably be, the perfection they had arrived at in measuring the year, which, it may be noticed, they made to consist of eighteen months, of twenty days each, to which were added five odd days, and that at the end of fifty-two years they introduced a period of thirteen days to complete their cycle; and Gama* with some success endeavours to prove that they introduced thirteen and twelve days alternately to their cycles, which would indeed reduce the measurement of the year to the degree of exactness at present followed in Europe. If we admit the arguments of Gama, they show the use of the second cycle of 104 years, and furnish evidence to prove, that it would require long continued and accurate observations of the heavens,

* Don Antonio de Leon y Gama, 'Descripcion Historica y Cronologica de las dos Piedras, &c.'—Mexico, 1797.

and a careful record of the same, to enable them to arrive at the conclusions they did, and to employ cycles of such long duration as fifty-two and one hundred and four years.

In geographical extent it will probably be ascertained, that the Toltec monuments may be traced from the Isthmus of Darien to Chihuahua, and that their language prevailed, or was at least known to the same extent, about 2400 miles.

In the State of Yucatan, pyramids, and other remains are said to be numerous. The ruined cities near Palenque, in the State of Chiapas, are of great extent, and of a very imposing character. In the State of Oaxaca are the ruins of Mitla and others. In Anahuac (or the Valley of Mexico) ruins and remains prevail to a great extent; near Zacatecas are the remains styled by the Spaniards *Los Edificios*, and in the State of Chihuahua are the *Casas Grandes*. Near Maconi and the river Panuco are the ruins of two cities; and besides those already described by travellers, there are many others to be noticed, and I have no doubt a great number still to be discovered.*

If we suppose all these monuments to have been the work of the Toltecs, or of kindred tribes to them, they would prove some guide as to the extent of their empire, and their greater frequency and scale in some places might be considered to indicate the seat of empire, or of power and dense population; and on this principle of reasoning, we might be induced to place the first and great seat of empire in the State of Chiapas, and the second at Teotihuacan.

Notwithstanding all that has been written on the subject of the monuments of New Spain, little progress has been made in coming to any satisfactory conclusion in regard to them. The field of investigation is a wide one and still open, and it is but now for the first time, from the number of scientific inquirers, and the liberty afforded them, that we may expect to acquire sufficient data on which to found our researches.

The plan of investigation to be followed would be, first, to fix geographically the sites of all such monuments, and secondly, to have them carefully examined in detail, dimensions taken, and drawings made of them, and occasionally excavations.

Having premised so much generally on the monuments and relics of the ancient inhabitants of New Spain, I now proceed to notice a collection of stone figures from the banks of the river

* Since the above paragraph was sent to press, I have received a letter from my friend General Yberri, of the Mexican service, and a corresponding member of this Society, stating that he was proceeding, by order of the government, to survey and make drawings of the ruins of a great and ancient city of the Indigenes, which had just been discovered (accidentally) in the mountains, about eight leagues from Jalapa, in the State of Vera Cruz.

Panuco, in the ancient district or country of Huastecas. These figures were procured by Mr. Francis Vecelli, while making a plan of the river Panuco and its banks, and purchased by me of him at Tampico, in the year 1832, and are now submitted to the inspection of the members of the Royal Geographical Society.

I shall first enumerate the figures, and then offer such remarks as have occurred to me in reference to them.

1. Male figure, with high conical cap, nearly complete, executed in shelly limestone.

2. Female figure, with ornamented head-dress, with low conical top, ear-rings, and lappets; on the reverse, carved simply but tastefully, in a fan, or lotus-fashion, in siliceous limestone.

3. Female figure, nearly complete, with conical cap, carved lotus-fashion on the reverse, in calcareous sandstone.

4. Female figure, nearly complete to the knees; from the neck to the hip-joint the proportions appear good. Head-dress, with conical top, and carved lotus-fashion on the reverse, in siliceous limestone.

5. Female figure, nearly complete, much corroded, high conical cap carved lotus-fashion on the reverse, in siliceous limestone.

6. Small female figure, with conical cap, in limestone.

7. Female figure, with conical cap, the base rounded instead of being square, like the previous ones; in shelly limestone.

8. Female figure, with conical cap and rounded base, in shelly limestone.

N.B. The head-dress of the two last resemble very nearly what I have observed in some Cingalese and Burmese figures.

9. Female figure, with ornamented conical cap, Ethiopian countenance, in calcareous sandstone.

10. Female figure, nearly complete, with conical cap, in calcareous sandstone.

11. Face (good). Eyes hollowed out for the insertion of gems, or plates of gold (head-dress restored).

12. Face and breast of a female figure; thick lips; much corroded; in limestone.

13. Male figure, with a species of helmet, in siliceous limestone.

14. Female figure, very rude, no other head-dress than a fillet, in calcareous sandstone.

15. Female figure, mantled and hooded, very rude, in limestone.

16. Figure, very rude, in siliceous limestone.

17. Female figure, with an infant on the shoulders of it; calcareous sandstone.

18. Figure, probably male (Herculean or extra size); from the waist to the calf of the leg clothed and ornamented. It is important to observe that the dress of this figure is almost identical with some of those formed of stucco in relief in the ruined city near Palenque, at the distance of near 600 miles from the Panuco.

19. Figure of a monster, part man, part fish, leaning on a staff, in shelly limestone.

20. Nondescript figure, bearing another on its shoulder, in siliceous limestone.

21. Circular stone, with a human face, very lightly relieved, in calcareous sandstone.

22. Cylindrical stone, with a grotesque face on it, in siliceous limestone.

23. Colossal head of a bird, in shelly limestone.

24. Large bull-frog, in calcareous sandstone.

25. Spherical stone, much carved, but much eroded, in limestone.

26. From another part of the country.

27. Two heads on one stone. I found this and another, accidentally, in my first journey up the country of Huastecas (1824).

28. Small figure, crouched and mantled, much wasted or eroded.

29. Small head, with very prominent features, similar to many of those figures from the walls of Palenque, in calcareous sandstone.

30. Small head, with head-dress, in calcareous sandstone.

With respect to the age or epoch of the figures enumerated, there is no tradition; and we can only form a rough estimate of the same, by observing the erosion, or atmospherical waste, they have undergone in a tropical climate. Those figures formed of shelly limestone are carious, from the falling out of the softer matter; indeed, as much so as I ever observed on the surface of any native rock. In those figures formed of calcareous sandstone of a hard and gritty nature, the waste is nevertheless considerable, and has produced a small dimpled surface, which may be well observed in figure 24 and some others, and will, no doubt, convey to the minds of all observers the impression of great antiquity. In figure 18, though of a very hard stone, the waste in some parts has been very considerable, as may be seen by comparing them with other portions of the same carving. Nos. 21 and 28 present very faded or softened lines, giving every impression of great waste and age; and in some others the projections of little wens and veins show partly the depth of erosion. Could we compare these stones with others of a like nature and climate, and of a known age, we might approximate pretty nearly to the times at which they were fashioned. Judging from my own observations and impressions, I should have little hesitation in pronouncing some of them to be at least a thousand years old, and others probably two thousand.

Whatever may be the absolute age of these figures, we may with safety ascribe them rather to the Toltec than the Alcohuan epoch, not only from their appearance of age, but from the circumstance, that the province of Huastecas had not partaken, like that of Anahuac, of the second dawn of civilization; but, above all, from the perfect similarity which figure 18 bears to the remains at Palenque, indicating that both were fashioned when

similar creeds and institutions prevailed, and that these extended from the banks of the Usumasinta to the Panuco.

The figures are mostly female; and the most novel, as well as extraordinary circumstance exhibited, is the character of the head-dress, expanded to a great size behind, with a square front, and conical top more or less elevated. Did these represent the dress of the people, or are they symbolical of some deity, or great personage among them? These are the first and only examples of this species of head-dress I have seen represented among the sculptural relics of New Spain, though I have no doubt others will be discovered; and the character is so extraordinary, that it may lead to connect not only many remains of the New Continent, but also those of the two Continents, should it really prove that the knowledge of the New World in early periods flowed from the Old one.

There is one remark which applies to nearly all the figures—viz., whether whole lengths or half lengths, they are terminated below by a considerable piece of unshaped stone, presenting no base for the support of the figure, and therefore showing that they were intended to be built into walls or platforms.

There is another general remark to be made—viz., that they are geological specimens of the nearest rocks to which they were found. Rocks on the banks of the Lower Panuco are scarce; but when they occur, consist of limestone and sandstone passing into each other, alternating with each other, and with friable or loose beds of shale and soft sandstone. The harder portions rise chiefly in slabs or layers, too thin for sculptural purposes, as will be seen from an inspection of several of the figures, and hence some ingenuity was required to give relief to the prominent parts. For instance, the nose of figure 2 is formed by cutting deep on each side of it. Where the stones have been obtained of more substance, more freedom and roundness may be observed, as in figure 4, where the trunk is in very good keeping.

If the figures under consideration are to be considered as specimens of the art to which the country and age had attained, a very low estimate must be formed of the civilization of the people. But gathered at random, it may be, that these are no more specimens of attainment of the arts than country sign-posts and grave-stones would be of the same in this country. To judge correctly, we must know the design and intended application of the figures, before we can pronounce the people rude and ignorant. This is, however, a subject on which we are constantly mistaking the attainments of ancient nations, by comparing their monuments with those of Greece and Rome. It became a taste or fashion with those nations to produce copies after nature of the human form, and the nearer they approached nature in her happier moods,

the more successful were their aims and intentions. But with the nations of Asia, which had not conceived the merit or value of imitating the living form, their intention was rather to depart from nature, and engraft exaggerations and peculiarities, to denote particular deities, heroes, or law-givers, and these figures were at once symbolical and historical; and thus, the huge and hideous, though well-executed stone figure, dug up in the square of the city of Mexico, in the year 1790, besides being symbolical of two or more divinities, probably contains a short history in the variety of carvings about it, and the complication of the parts is such, as must have rendered it most difficult to execute, from the original design; and although exhibiting no grace or taste, fulfilled the intention, and confers no small credit on the artificer of it.

Where the design is evidently and solely to copy nature, the success of the effort is unquestionably a proof of the state of the art or skill of the artist, and in this point of view, the body of figure 4, and the face of figure 11, may be taken as favourable samples, due allowance being made for the nature of the materials.

The features of the face are very different in these figures, although the general character is that of high cheek bones and thick lips. The foreheads are high and broad. Indeed, in some of the small terra cotta heads I procured from Teotihuacan, the forehead is almost too largely developed to be natural. What then becomes of the observations of Humboldt in his researches? "It is no doubt from following this standard of beauty, that even the Astec people, who never disfigured the heads of their children, have represented their heroes and principal divinities much flatter than any of the Caribs I saw on the Lower Orinoco." For my own part, most of the figures I have procured or seen in New Spain, so far from justifying the above remark of Humboldt, just lead me to opposite conclusions.*

The value to be attached to the present collection is to throw some light on the condition and extent of the Toltec empire, by affording the means of comparing the remains on the banks of the Panuco with those of other parts of the same continent, and also with the relics of the Old World, should it have happened that the Toltecs derived their knowledge and civilization from thence. This last is an important question in the history of man. I was

* The modern traveller in New Spain must own at every step his obligations to Humboldt, for directing his attention to almost every point of interest, and he will have many occasions to be astonished how so much and such diversified information could be amassed by one man in so short a space of time. The subject was, however, too vast not to leave room for omissions in some parts, and equivocations in others; and to supply these deficiencies, the researches of the modern traveller are to a great extent limited, and at the risk of appearing to cavil at the writings of a traveller highly and justly celebrated.

rather disposed to believe at one time, that whatever knowledge and civilization the Toltecs possessed was of American growth; but the numerous pyramidal erections would rather countenance the opposite opinion. These structures in very flat countries, and on the banks of great rivers, as those of the Nile, the Euphrates, and the Ganges, are appropriate and imposing in their character, and may have had their origin, as retreats for the inhabitants from floods; but no such effects or uses could apply at Cholula and Teotihuacan, where mountains tower above them, in their near vicinity, to the height of 10,000 feet.

Plate, No. 1—Exhibits a front and back view of the stone figure (No. 2) from the banks of the Panuco. The front view is a good sample of the style of head-dress characteristic of most of these figures—certainly very extraordinary, and probably the first specimen of the kind submitted to public notice. The large ear-rings with pendants or lappets, as well as the position of the arms and hands, are also characteristic; while the back view shows the fan-like carving, common to four of the figures, and most likely emblematical.

Plate, No. 2—Presents drawings of heads in terra cotta, from the ruins of Teotihuacan. These appear all to have formed ornaments of, and to have been broken from, articles of coarse domestic pottery, and are introduced here to show that the arts could not have been very low with a people who, with such coarse materials, and for such common purposes, could fashion heads on so small a scale, exhibiting so much character and expression, as in figures 1 and 2.

Figure 1 seems intended to show a peevish male countenance of sixty or seventy years; and that of No. 2, the emaciation of extreme old age, which may sometimes be observed in subjects of warm climates.

Figures 3 and 4 are specimens of heads with features common to that of great numbers found at Teotihuacan, and may therefore have resembled the people by whom they were formed; their chief peculiarity seems to consist in the size and expansion of the forehead.

While the preceding remarks were passing through the press, I was informed that Dr. Von Martius, of Munich, had printed a paper in the Transactions of the Royal Academy of Bavaria, which threw doubts upon the existence of the Toltecs as a distinct nation. I have not read that paper, but subjoin this short notice in order to throw as much light as possible on the subject:—

Summary Notice of the Toltec People.—The arrival and settlement of the Toltecæ on the borders of Anahuac (Valley of Mexico) is generally reported to have occurred in the seventh century of the Christian æra.

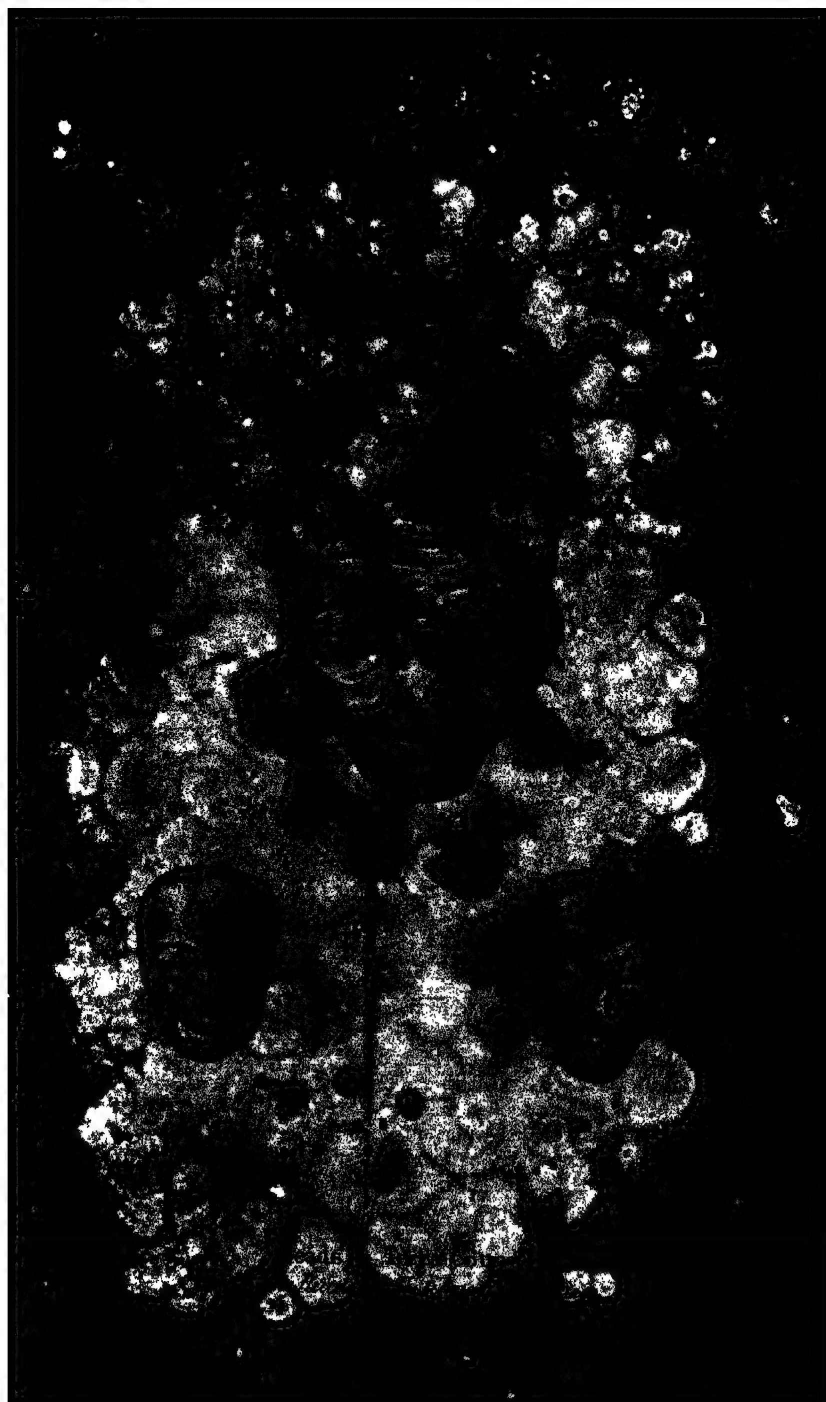
Clavigero, who compared several authorities, and made his own computations, has fixed the date of the foundation of the city of Tollan (Tula), and the commencement of the Toltec monarchy, in the year A. D. 667; and the same author places the ruin and close of the empire at the period of the death of King Topiltzin in the year 1051; remarking very justly that the latter event could not be much postponed, in consistency with the succeeding narratives of the Chechemecas and Acolhuas.

It appears to me that the period of 384 years, assigned by Clavigero for the duration of the empire, is much too short, for the necessary increase of population and resources to enable the Toltecs to erect such edifices as the pyramids of Cholula and Teotihuachan, and that the date of the commencement of their power in Anahuac must have occurred much earlier than what he has fixed upon.

The destruction of the Toltec empire has been ascribed to a period of severe pestilence and famine, which almost extinguished the race. This account does not, however, appear to me reconcilable with other circumstances, nor is it an event probable in itself; since history hardly affords an analogous case of a great and numerous people being so nearly destroyed or scattered by such calamities *alone*. This catastrophe will be much more satisfactorily explained by referring it to the frequent inroads of barbarous Chechemecas and Otomies from the north, in the train of which incursions might indeed have followed pestilence and famine. Of these frequent incursions of barbarians from the north (to whose depredations may be ascribed the destruction of the Toltec cities and people) I have not seen any accounts; but many circumstances warrant the belief that it must have been so.

Xolotl, the leader of a powerful army of Chechemecas and Otomies, entered Anahuac, and fixed the seat of his monarchy at Tenayuca in the year 1170, and placed a barrier to farther irruptions of a like nature from the north. At this period the principal cities of the Toltecs were probably in ruins and deserted. Xolotl, however, appears to have fully appreciated the arts and knowledge of the people amongst whom he had settled, and afforded them protection and encouragement, and endeavoured to unite them with his own followers for the purpose of civilizing and instructing them better; and such was the celebrity of the Toltecs for their skill in the arts, that whoever became able as an artificer, was honoured by the appellation of Toltec (Toltecalt): so that in process of time the terms Toltec and skilful artificer became almost synonymous.

From the death of Topiltzin in 1051 to the establishment of the Chechemecan monarchy in 1170, the country of Anahuac was probably in a state of anarchy and distress. The reign of



Xolotl afforded rest and a return to regular government, and from that epoch the events recorded in history begin to thicken, and a somewhat continuous and consistent narrative then commences, and continues to the date of the Spanish invasion; verified in many instances by reference to recorded eclipses.

II.—*On Sind.* By Captain A. Burnes, E. I. C. Communicated by the Geographical Society of Bombay. *Read February 27,* 1837.

Much has been said upon Sind;* and I have perused most of that which has been published, as well as written. I purpose therefore to state concisely, the result of my reading and observations. I do not record my authorities, and I leave others to find out the points on which I differ from preceding writers. It is however due to Mr. Nathan Crow, of the Bombay Civil Service, to state that his "Account of the country of Sinde" appears, as far as I can judge, to have been the text book of all succeeding writers. It is a finished essay; and, though written so far back as the year 1800, remains to this day a model which, I think, will seldom be surpassed. It may then be asked what leads me to write on Sind? I do so because we have had many, and late, opportunities of increasing our information. In my printed work too, I have rather confined myself to the river Indus than the country through which it flows. It must be borne in mind, however, by all who peruse this paper, that it is one of results.

The country watered by the Indus is called Sind. This is also the name given to that river itself by the inhabitants. The designation is ancient, since Arrian† mentions Sindomana. To speak generally, that country, from the ocean to the confluence of the Panjáb rivers with the Indus, bears the name of Sind. That is from the latitude of about 23° to 29° N. and from 67° to 71° E. longitude. The banks of the Indus, however, as high as Sengar, which is in about 31° North, are sometimes called Sind. Without this addition, the area of the country includes about 100,000 square miles. On the South it has for its boundaries the province of Kach'h and the Ocean. On the East it has Rájwárá, or, the country of the Rájpúts, as also the Daúdputrás. On the North it has the Panjáb and Kach'h Gandávah. On the West lies

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* Sind, in Hindí *Sind'h*, is the land of the Sind'hu or Indus. In the ancient Persian and several modern dialects H is substituted for S, and the unaspirated for the aspirated letter. Hence Sind'hu became Heandu, Hendu, Hindú, Hind, Indu-s. —F. S.

† De Exped. Alexandri, vi., 16. It was the capital of Sambus.—F. S.

Belúchistán, from which it is separated by the lofty mountains of Hálá.

The great feature of Sind is the Indus. It traverses the country diagonally in one trunk to the latitude of 25° 30′,* when it begins to throw off branches. Its Delta, however, commences below T'hat'hah in the latitude of 24° 40′,† after which it enters the sea by eleven mouths, and presents a face of 125 British miles to the ocean. The sources of this great river are unknown. It is certain that it rises in the mountains of Himálaya near Thibet. It is probable that the Shayúk from Karákórum and the river of Ladák'h, from near the Lake Mánsaró́war‡, are its principal feeders. From Kashmír the Indus is separated by a snowy range. It then receives the Abá Sín and passes on to Atak, where it is joined by the Lándaï, or river of Kábul. One of the sources of this tributary descends from Pámér, and is nearly as remote as the principal branch. From Atak to the sea, the Indus is familiarly known by the name of "Sind," or "Atak." Mihrán is a name only known to foreigners. Atak signifies "forbidden,"§ and it is said to be so called, because the Hindús are forbidden to cross it. Below the Panjáb rivers, it takes the name of "Sirá" down to Sehwán, and from thence to the sea that of "Lár." These are two Belúchí words for north and south. The local names for different parts of the Indus are various. Those of the branches in the Delta shall be afterwards enumerated.

The face of Sind is uninteresting. Eastward of the Indus, there is not a rising ground nor a stone in the country, excepting the hillocks of Bhakar and Haïder-ábád. It is flat and covered with bushes, till it at last joins the desert of sand-hills which separates Sind from India. Westward of the river, as low down as Sehwán, the same flatness prevails to the base of the Belúchí mountains. From that town to the sea, the land is rocky and barren. The Delta of the Indus does not differ from that of other rivers. It is rich, but it is poorly cultivated. Ten miles from the sea, it is frequently an impervious thicket. Higher up, it is overgrown with tamarisk shrubs, which also thread into each other. The rest presents a naked plain of hard caked clay. Much of the land that is adapted for agriculture, is only used for pasture. Much of it also lies neglected; yet the crop of rice is extensive, and far exceeds the consumption of the country. It is the staple of Sind; the inhabitants live on it, the merchants export it. It is more abundantly produced towards the sea; higher

* At about 105 geographical miles from the sea, direct distance.

† Or about fifty miles from the coast.—*Ed.*

‡ Manas-saróvara, i. e. the mental or spiritual lake.—F. S.

§ Rather 'Bar,' 'obstacle.'—F. S.

up, the other grains—wheat, barley, juwárí,* &c. are cultivated; also indigo, sugar-cane, tobacco, and hemp: both the latter are used as narcotics. There are but few trees in Sind.

Sind owes its fertility entirely to the Indus, and more particularly to the annual or periodical swell of the river. The return of the waters is regular—they rise in March and subside in September. The melting of the snow in the Himálaya is the cause of this phenomenon. The waters are courted by the inhabitants and distributed by canals far away from the river. The actual swell seldom extends half a mile on either bank. The immediate banks of the Indus are but partially cultivated. The soil is saline and unfavourable to tillage, as is proved by all its spontaneous productions. Without the Indus, the whole of Sind would become as perfect a desert as the country lying eastward of it. Encrustations of salt and saltpetre are to be seen everywhere. The latter is exported. Many of the shrubs yield alkalis, which are used in manufactures. With all these natural disadvantages, the revenue of the country in these days sometimes reaches forty lacs of rupees (£400,000). In the government of the dynasty that preceded the present, it yielded eighty lacs (£800,000). The depreciation arises partly from political causes. The treasure possessed by the rulers is considerable.† In the strict sense of the word, Sind cannot be considered rich; possessing a resemblance to both Egypt and Bengal, it has not the richness of either. The crops, however, are reaped without labour; the seed is scattered after the inundation, and the harvest is certain.

The history of Sind is clearer than most Asiatic Chronology; the marked feature of the Indus running through it, has contributed to preserve it. Herodotus says, that Darius Hystaspes sent an expedition to explore the Indus, which sailed out of the river. Alexander the Great turned this information to account. He found the country inhabited by Hindús, and ruled by Bráhmans. It was made subject to the ephemeral kingdom of Bactria, but regained its independence, which it preserved till the rise of Islám, when, after various struggles, it became Mohammedan. In the first century of the Hijrah, or the seventh of the Christian era, the caliphs overturned the Brahmanical dynasty, and ruled by deputies from Bagdad. Dahr, son of Chach,‡ was the name of the deposed Rájá, and Alór,§ near the modern B'hakar, was his capital. Sultán Mahmúd of Ghaznaïn|| conquered it in the eleventh century.

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* Holcus Sorghum of Linnæus, Sorghum vulgare. Persoon, Syn. 1801, Large or Indian Millet.—F. S.

† This, however, has been much overrated, and particularly so by myself.

‡ Dáhar or Váhar, son of Jaj, in the Ayín Akbarí, ii. 118. 8vo. Ed. § Or Alwar.

|| Ghuzni, for *Ghaznah* or *Ghaznaïn* (the two Ghaznahs), was first introduced by that father of distortions, Col. Dow, who transformed the Moghul name Alptegín into Abistagi, partly from an error in his Persian MSS., and partly because his Munshís made the final n quiescent.—F. S.

Iletmish,* the Ghaurian Sultán of Dehlí, made it a fief of his crown, which it continued till the fourteenth century, when the native Rájás recovered their ascendancy. The successful tribe was the Súmrá,† which was settled in the confines of Makrán at the Mohammedan invasion. They did not long retain their power, and were displaced by the Símah, another great and ancient native tribe, which yet exists in the country. They took the title of Jám. The Rájá of Kach'h and the Járéjah Rájpúts, are descendants from these Símahs. There are both Hindú and Mohammedan Símahs. They held it till it was again subdued, after some difficulty, by the Tátár conquerors of Dehlí; who, for a time, used the Símahs to govern it. Nádir Sháh annexed it to his crown, and it formed a portion of the kingdom of Kábul, raised up by Ahmed Sháh, one of his generals, to which it is nominally subject at this day. In the time of Nádir the country was granted to the Kálórás, a religious family from Belúchistán. In the reign of Tímúr Shah of Kábul, it was conferred on the Tálpúr family, also of Belúch origin, who now hold it.

The inhabitants of Sind are much scattered, but the country is not populous. In traditional poesy, it is said to be "*nau lak'hí Sind'h*," that is, nine-lac Sind. The meaning of this is obscure, but I do not discard it; for the same rhyming statistics assign "*Chaud Chárí*" (or 14 times 40=560) to Kach'h. Though in excess of its number of inhabited places, this is sufficiently near to be understood. Sind is said to have a lac of pír's, or saint's tombs in it. To quit legends, Sind has a vast number of villages, most of which are moveable. In the desert they are called "*Wánd*," near the river "*Ráj*" and "*Tándá*." The temporary villages of Sind are distinctly mentioned by the Greeks. It is difficult, in consequence, to fix the population of Sind; it is difficult even to fix the number of inhabited places. A village is often changed, and, if stationary, it even changes its name with its owner. This is but a remnant of the pastoral life of the aborigines. No two maps of Sind can resemble one another. The provinces or subdivisions of it even change names. I find no less than fifty names of these in one author, and he says that their limits run into each other. Even in Alexander's times, we have the names of so many kingdoms on the Indus, that we can only account for them by exaggeration, to enhance the conquests of the Greeks. The whole population may amount to a million. The greater portion of it is moveable. The large places are not numerous. Shikár-púr is the first in importance, and has a population of about 25,000, which surpasses that of the modern capital

* Iletmish is the participle past of the verb. iletmek, to "bear," "lead," &c. Altmish, "sixty," is not admissible here.—F. S.

† Sóma Ráí, of the Lunar Royal Race ?—F. S.

Haïder-ābád. T'hat'hah, the ancient metropolis, has about 15,000 souls. The only other places of note are Sabjal, Khaïr-púr, Lád-khání,* B'hakar (with Rórí and Sakkar), Sehwán, Hálá, and Karách'hí, which latter is a seaport, and the only one accessible to ships in the country.

The inhabitants of Sind are chiefly Mohammedan. A fourth of the population may be Hindú. There are no people of other tribes or creeds, if we except a few *Sik'hs* of the Panjáb, called *Sik'h* Lóhání. The Mohammedans are tall and well proportioned; very dark in complexion. All other Mohammedans shave the hair of the head, but the Sindians preserve it, which gives them a look very different from other Asiatics. They also wear caps instead of turbans. Sind'hí is a term generally used for those who live in temporary villages. They are mostly the original inhabitants converted to Islám, who have intermarried with the conquerors. There are Mohammedans in Sind, and Hindús in Kach'h, who claim one lineage. The Hindús do not differ from those in India. They are fairer than the Mohammedans. The Lóhání and Bhátïá tribes prevail: they are purely commercial. They are not oppressed more than in other Mohammedan countries. They are often employed in places of confidence. They amass wealth, but they conceal it, and wish to appear poor.

The subjugation of Sind has been always facilitated by the Indus. India escaped in many places the inroads from the West, but Sind was one of the earliest conquests of every invader. It is easily accessible from the Panjáb, but it is separated from India by a desert. Sind has very little resemblance to India on that account. The people have not the effeminacy of the Indian, nor have they the polish of the Persian. They are less civilized than either; ignorant, and very bigoted. This arises from the nature of their government. It continues from the limited connexion with other countries. The Mohammedan invasion involved a change of creed among the people, and the impression has never been effaced. The dynasty of the Kálórás was religious, and the effect of it is apparent everywhere. It has been well said, that in Sind "there is no spirit, but in celebrating the 'íd†, no liberality, but in feeding lazy Sayyads, and no taste but in ornamenting old tombs." The desire to propagate the faith does not now interfere with a certain degree of toleration towards the Hindús; that tribe is not respected, but it is not degraded. An unclean idolater is a common term of reproach, but has much the same acceptation in Sind as heretic has among Protestants and Roman Catholics. Justice is meted out to both; if it cannot be claimed it is not re-

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* Or Lárk'hání.

† The Festival at the end of Ramazán (Lent), called Baïrám by the Turks.—F. S.

fused. There are no great Hindú buildings in Sind, but there are at the same time no grand Mohammedan ones, except a mosque and some tombs at T[illegible]hah.

The government of Sind may be called despotic. Its rulers, the Amírs, are restrained by no laws, though they pretend to abide by the dicta of the Korán in their administration of justice. There are no officers such as Kázís or Múlás, who exercise, independent, their functions, or receive their patronage and encouragement. Sayyads and Fakírs are, however, respected to veneration, the one as being descended from the line of the prophet, the other as following, or pretending to follow, a life of great austerity. Many of the fakírs are, without doubt, virtuous men, but the great bulk are hypocritical fanatics. The universal respect shown to them seems to have corrupted the land. The mendicants in Sind are more numerous than in any other country in Asia. They can scarcely be called beggars, for they levy tribute in crowds, and, by threats, with great arrogance. Many of the common people take to this profitable vocation, which only requires some show of sanctity. This is exhibited in various ways; one of the most common is to sit all night on the house-top, and repeat the sacred name of "Allah" (or God) as many thousand times as the tongue can utter it. In Sind, religion takes the worst possible turn. It does not soften the disposition of the rulers or the asperities of the people! it becomes a trade, and its worthless professors degrade it and themselves. To this there is no counteracting effect in the Government, which, besides encouraging these worthies, is, in itself, politically oppressive. Trade and agriculture languish under it. The people have no stimulus to moral rectitude, and yet they are less degraded than might be looked for. They are passionate as well as proud. They have much subtle flattery, but this does not deceive in Sind. If trusted, the Sindian is honest; if believed, he is not false; if kindly treated, he is grateful. I repeat, that in oppression the Mohammedan and the Hindú appear to be pretty equal sharers.

Without political freedom, and with misdirected religious zeal, Sind cannot boast of the condition of its population. There is no intermediate class between the rulers, their favoured Sayyads, and the common people. Some Hindús are rich, but the mass of the people are poor. Their dress, subdued manners, and filth, all attest it. They have no education; few of them can read; very few write. In physical form they seem adapted for activity, the reverse is their character. Their faculties appear benumbed. Both sexes, Hindú and Mohammedan, are addicted to "Báng," an intoxicating drug, made from hemp. They also drink a spirit distilled from rice and dates. Debauchery is universal, and the powers of man are often im-

paired in early life." They do not seek for other than gross and sensual amusements. People only congregate to visit the tombs of worthies or saints, who are deemed capable of repairing the wasted and diseased body, as well as the soul. They have few social qualifications, and even in common life keep up much formal ceremony. There are no healthful exercises among the peasantry, who, as well as the grandees of the land, lead a life of sloth. To be fat is a distinction. A better government would ameliorate the condition of this people; without it the Sindian and his country will continue in the hopeless and cheerless state here represented. I venture to reverse the observation of Montesquieu, and say that the mediocrity of their abilities and fortunes is fatal to their private happiness. The effect is also fatal to the public prosperity. It is unnecessary to state that the sciences are not cultivated in Sind. The arts, however, exhibit some taste and ingenuity. Leather is better prepared than in any part of India; and their "lúngís," or silk-cotton cloths, are rich and beautiful. The artisan receives no encouragement; the peasant has no reward for his toil.

The language of Sind is of Hindí origin. The upper classes speak corrupted Persian, the lower orders a jargon of Sind'hí and Panjábí. Sind'hí is a written language.

A despotic government is necessarily upheld by force. The citizen is lost in the soldier. The great portion of the land in Sind, is held on the tenure of affording military service. External enemies are not now to be much dreaded, so that the fetters of the people are forged for themselves. They furnish their rulers with the means to oppress. They never knew a citizen's rights, and they are as ignorant of their own strength as of their rulers' weakness. Most of the chiefs in Sind are Belúches. In their relative position to the people, they, in some degree, resemble the Mamlúks of Egypt. They are not, however, recruited (as was that body) from abroad, though they keep up a connexion with their native country. They are the last invaders of Sind. The time of their inroad, I cannot fix, but it was probably a succession of inroads. It is now difficult to distinguish a Belúch from any other Sindian, for they have intermarried with the people. They preserve, however, with care their lineage, and name their tribes with honour. The Sindians complain of the oppression of the Belúches, but habit has subdued their energies to resist. The military power of Sind is considerable. For an Asiatic state it is respectable, though without discipline. The force consists of infantry; the arms are a matchlock and sword. The former is of a description peculiar to Sind. There are few horses, so that there is a want of cavalry. There are guns in Sind, but their artillery is always ill-served and neglected. On

a foreign inroad the country would rise in arms, and the three different Tál-púr chiefs would contribute their contingents to meet the enemy. From an European force I believe they would shrink without resistance; certainly without any persevering opposition. As a soldier the Sindian is considered brave; at least he is respected by his neighbours, and often hired by them as a mercenary. He does not lose his reputation by being forced to yield to disciplined valour, which is an exotic.

The productions, both vegetable and animal, in Sind, differ but little from other parts of India. Most of the former have been already mentioned. Many of the European vegetables that are now so common in India, have not been introduced. Apples are, however, found even so low as T'hat'hah. The climate of Sind is variable. In the winter the cold is great: ice is common. In summer the heat is most oppressive, and rain is almost unknown. The dust is intolerable. The clayey nature of the soil admits of all moisture being soon exhaled, and the least wind raises clouds of impalpable powder. The houses require ventilators in the roof, and the windows and doors are made of the smallest dimensions to exclude the dust. Altogether the climate of Sind is sultry and disagreeable, and very trying to the constitution. The only remarkable tenant of the Indus is the sable-fish (palá), which enters the river four months during the year. This fish is not found in any other of the rivers of Western India: it is highly flavoured. Game of all kinds is abundant in Sind; but the country is thick, and it is difficult to kill it. The camels and buffaloes of Sind are superior and very numerous. The horned cattle and sheep are in general larger than those of India. Of all these there are vast herds. They are to be found both near the river and away from it. All that tract between Sind and India, and north of the Ran* of Kach'h, is frequented by herdsmen and shepherds, who find water in wells and tanks. They live in "wands," and are erratic in their habits. The tract is much more frequented than its appearance in the map (where it is described as a desert) would suggest. There is pasture between the sand-hills, and they themselves are not destitute of verdure. The *pílú* (salvadora persica), *karíl*† (capparis aphylla), *bábul* (mimosa Farnesiana), and *p'hók*, are its principal productions, with the thorny milk bush and swallow wort (asclepias gigantea). The geological features of Sind need not detain me. I found fossil shells at Jerk and Luk'hpat. At the latter place some of these weighed twelve and sixteen pounds English, and were in a

* Great Salt Morass.

† This is the Arák of the Arabs (not Bruce's Rack), also called Karír and Kair. The author writes khureel; so that the Sind'hians probably say k'haril with an aspirated *h*.—F. S.

perfect state of preservation. They were imbedded in limestone. Westward of the Indus various kinds of marble are found. Limestone indeed appears to be the principal formation. Sandstone also exists. I found a small piece of it, about forty miles north of Luk'hpat, imbedded in the soil, which, for the first foot, was mixed with fresh-water shells. There are many mineral springs in the Hálá mountains.

It has been already observed that the most striking geographical feature of Sind is the Indus.

Its length of course, and the body of water discharged by this river, prove it to be one of the largest in the old world. Its tributaries even are rivers of some magnitude. The Hydaspes, Hydräotes, and Hesudrus, are superior to the Rhone. The course of the Hyphasis is forty miles longer than that of the Elbe, and only sixty less than that of the Rhine. Yet the channel of the Indus seldom exceeds the width of half a mile. In the winter it is even narrower. During the season of inundation the different branches which it throws off are filled. By October they become unnavigable and stagnant. The Indus is a foul river and very muddy, with numerous shoals and sand-banks. Though there is generally a depth of twelve feet in the shallowest parts, flat-bottomed boats only can navigate it. The reason of this is, that vessels with a keel get fixed on the banks, and would be destroyed. The Indus is navigable for about 1200 miles from the sea. Boats may drop down it from within fifty miles of Kábul. Above its junction with the river of Kábul, the Indus is not navigable.

After the Indus has fairly entered Sind, it throws off its branches. At B'hakar, which is an insulated fortress of flint on the Indus, below the latitude of 28° the superfluous waters of the inundation are sometimes drained off by a channel. In two years out of three it is dry; but when this channel is followed, the water passes the ancient city of Alór (four miles from B'hakar), and through the desert near Amerkot, to the Eastern mouth or Kórí. Some authors suppose this to have been once the course of the great river. The reasons are more specious than probable. The first permanent offset of the Indus is the Feleïlí, which passes eastward of the capital Haïder-ābád. It successively takes on the name of Guní, P'hárán, and Kórí, and separates Kach'h from Sind in the lower part of its course. The next offset takes its departure near Jerk, and is named Pinyárí. It afterwards is called Gungrá, and where it enters the sea, Sír: both these branches, the Feleïlí and Pinyárí, have been closed by "bands" or dams, for the purpose of irrigation. At their estuaries, therefore, they are but creeks of the sea, and have salt instead of fresh water, if the inundation does not make them

fresh by its excess. Some remarkable changes were brought about in the eastern mouth from an earthquake in 1819, by which a large tract of land was, and still continues, submerged.

About five miles below T'hat'hah, the Indus forms its Delta by dividing into two branches. These bear the names of Bágár and Sátá. The first runs off at right angles westward; the other flows southward. The Bágár passes Pír Pattah, Dáráji, and Láhorí Banders, and enters the sea by two subdivisions, the Pití and Pitiyání. The Sátá subdivides into seven streams, and reaches the sea by the mouths of Juwah, Richel, Hajámárí, Khédiwárí Gópá, and Mall. There are even other subdivisions, but it would only confuse to name them. All these mouths have communication with each other, so that the internal navigation of the Delta is extensive. The course of the waters of the Indus is most capricious and inconstant. One year the Bágár is dry, and in another the Sátá shares a like fate. In 1809 the principal portion of the waters were disembogued by the Bágár. In 1831 their channel of egress was confined to the Sátá. The seven mouths of the Sátá even vary in their supply of water, but one branch of the Indus is always accessible to country boats. The great mouth at present is the Górá, but, from sand-banks, it is not accessible to ships. Those mouths which discharge least water are most accessible.

Kach'h, January, 1836.

III. *Narrative of a Journey from the Tower of Bá-'l-ḥaff, on the Southern Coast of Arabia, to the Ruins of Naḳab al Ḥajar, in April,* 1835.—Communicated by Lieutenant Wellsted, Indian Navy. *Read January* 23, 1837.

During the progress of the survey of the south coast of Arabia, by the East India Company's surveying vessel the Palinurus, while near the tower called Bá-'l-ḥaff, on the sandy cape of Ras-ul Aseïdá, in lat. 13° 57′ north, long. 46¾° east nearly, the Bedowins brought us intelligence that some extensive ruins, which they described as being erected by infidels, and of great antiquity, were to be found at some distance from the coast.

I was in consequence most anxious to visit them, but the several days we remained passed away bringing nothing but empty promises on the part of Ḥámed* (the officer in charge of the tower,) to procure us camels and guides; and at length, in the prosecution of her survey, the ship sailed to the westward.

On the morning of her departure, April 29th, 1835, some hopes were held out to me that if I remained, camels would be procured in the course of the day, to convey us to some inscriptions, but a few

* An abbreviation for Aḥmed or Mohammed.—F. S.

hours' distance from the beach; and in this expectation I remained behind with Mr. Cruttenden, a midshipman of the Palinurus, and one of the ship's boats.

Towards noon the camels were brought, and I was then somewhat surprised to hear, after much wrangling among themselves, the Bedowins decline proceeding to the inscriptions, but express their readiness to accompany me to the ruins I had before been so desirous of visiting. For this I was then unprepared; I had with me no presents for the Sheïkhs of the different villages through which I had to pass, and only a small sum of money; but what (as regarded our personal safety) was of more moment, Hámed, who had before promised to accompany me, declined (on the plea of sickness) now to do so.

It was, however, an opportunity of seeing the country not to be lost, and I determined at once to place myself under their protection, and proceed with them. Accordingly, I dispatched my boat to the vessel with an intimation to the commander that I hoped at the expiration of three days, to be at the village of 'Aïn, on the sea coast, when he could then send a boat for me.

Having filled our water skins at three P. M., accompanied by an ill-looking fellow (styling himself the brother of Hámed), and another Bedowin, we mounted our camels and set forward.

The road after leaving Bá-'l-haff extends along the shore to the westward. On the beach we saw a great variety of shells; among them I noticed (as the most common) the Pinna fragilis, the Solen, the Voluta musica, and several varieties of Olives; fragments of red tubular coral, and the branch kind of the white, were also very numerous.

Under a dark barn-shaped hill, which we passed to the right, our guides pointed out the remains of an old tower, but as we were told there were no inscriptions, and as its appearance from the ship indicated its being of Arab construction, we did not stay to examine it.

At 4h. 50m. we passed a small fishing village called Jilleh, consisting of about twenty huts rudely constructed with the branches of the date palm. Along the beach above high-water mark, the fishermen had hauled up their boats, where they are always (unless required for use) permitted to remain.

In their construction they differ in no respect from those which I have described in other parts of the coast.

At 7h. 20m. we left the coast, and wound our way between a broad belt of low sand-hills, until 8h. 30m., when we halted for about two hours, about three miles from the village of 'Aïn Jowárí, to which one of our guides was dispatched, in order to secure a supply of dates, the only food they cared to provide themselves with. Directly he returned we again mounted. At 11h.

the loud and deep barking of some dogs announced to us that we were passing the village of 'Aïn Abú Mabúth,* but we saw nothing of the inhabitants, and at 1h. A.M. we halted for the night.

We were now in the territories of the Diyabí Bedowins, who, from their fierce and predatory habits, are held in much dread by the surrounding tribes. Small parties while crossing this tract, are not unfrequently cut off,—and we were therefore cautioned by our guides to keep a good look-out for their approach. But after spreading our boat cloaks in the sand, we were little annoyed by any apprehensions of this nature, and slept there very soundly until the following morning, Thursday, April 30th.

The Bedowins called us at an early hour, and after partaking of some coffee which they had prepared, we shook the sand (in which during the night we had been nearly buried) from our clothes, and at five A. M. at a slow pace we again proceeded on our journey.

At 7h. we ascended a ledge about 400 feet in elevation, from the summit of which, we obtained an extensive but dreary view of the surrounding country. Our route lay along a broad valley, either side being formed by the roots or skirts of a lofty range of mountains. As these extended to the northward they gradually approach each other, and the valley there assumes the aspect of a narrow deep defile. But on the other hand, the space between our present station and the sea gradually widens, and is crossed by a barrier about thirty miles in width, forming a waste of low sandy hillocks;—so loosely is the soil here piled that the Bedowins assure me that they change their outline, and even shift their position with the prevailing storms. How such enormous masses of moving sand, some of which are based on extensive tracts of indurated clay, could in their present situation become thus heaped together, affords an object of curious inquiry. They rise in sharp ridges, and are all of a horse-shoe form, their convex side to seaward.† Our camels found the utmost difficulty in crossing them, and the Bedowins were so distressed that we were obliged to halt repeatedly for them. The quantity of water they drank was enormous. I observed on one occasion a party of four or five finish a skin holding as many gallons.

At 8h. we found the sun so oppressive that the Bedowins halted in a shallow valley under the shade of some stunted tamarisk trees. Their scanty foliage would however have afforded us but slight shelter from the burning heat of the sun's rays, if our guides had not with their daggers dug up or cut off the roots and lower branches, and placed them at the top of the tree. But

* So pronounced, but probably 'Aïn Abú Ma'bad.—F. S.

† The same formation of sand-hills was found by Pottinger in Belúchistan, and by Dr. Meyen in 1831, in the Pampa grande de Arequipa.—*E.*

having done so, they quietly took possession of the most shady spots, and left us to shift the best way we could. Although we were not long in availing ourselves of the practical lesson they had taught us, I began to be far from pleased with their churlish behaviour. Every approach I made towards a good understanding was met by the most ungracious and repulsive return.

They now held frequent conversations with each other apart, of which it was evident we were made the subject,—and they not only refused fire-wood or water, in other quantities than they considered sufficient, but they watched our movements so closely, that I found it, for a time, impossible to take either notes or sketches.

I have no wish to drag forward anticipated dangers, but it was impossible but that I should feel if these men played us false, our situation must have been a critical one. I know that the natives of this district were reported to be especially hostile to those of any other creed than their own, and that they had some years ago (by seducing them with promises from the beach) cut off the whole of a boat's crew of the only vessel that had previously touched on their coast, and I could not but attribute to myself some degree of rashness, in thus venturing with no better pledge, than their fidelity, for our safety. There was however but little time for such reflections, and without evincing in my manner any change, or mistrust, I determined to watch their conduct narrowly, and to lose sight of nothing which might be turned to our advantage.

At 10h. 30m. continued our journey on the same sandy mounts as before. At 1h. 30m. we passed a sandstone hill called Jebel Másinah. The upper part of this eminence forms a narrow ridge presenting an appearance so nearly resembling ruins, that it was not until our subsequent visit to them that we were convinced to the contrary. We had now left the sandy mounts and were crossing over table ridges elevated about 200 feet from the plains below, and intersected by numerous valleys, the beds of former torrents, which had escaped from the mountains on either hand. The surface of the hills was strewn with various sized fragments of quartz and jasper, several of which exhibited a very pleasing variety of colours.

In the valleys the only rocks we found were a few rounded masses of primitive cream-coloured limestone. Placing the existence of these in conjunction with the appearance of the mountain on either side, I have no hesitation in pronouncing them to be of this formation—which is indeed the predominant rock along the whole southern coast of Arabia.

A few stunted acacias now first made their appearance, which continued to increase in size as we advanced.

At four P. M. we descended into Wádi Meïfah, and halted

near a well of good light water. The change which a few draughts produced in the before drooping appearance of our camels, was most extraordinary. Before we arrived here, they were stumbling and staggering at every step; they breathed quick and audibly, and were evidently nearly knocked up—but directly they arrived near the water, they approached it at a round pace, and appeared to imbibe renovated vigour with every draught. So that browsing for an hour on the tender shoots of the trees around, they left as fresh as when we first started from the sea-coast, notwithstanding the excessive heat of the day, and the heavy nature of the road.

It may appear strange that these animals should have been so much distressed in crossing a tract of only forty miles. Camels however differ in Arabia, in point of strength and speed, more than is generally supposed. These with us at present bore about the same resemblance to those on which I journeyed from 'Aden to Láhejí, as a first-rate hunter would to a post-horse in England.

During the time we remained here, an Arab brought several fine bullocks to water. They have the hump which we observe in those of India, and to which in size, the stunted growth of their horns, and their light colour, they bear otherwise a great resemblance.

Arák trees are here very numerous, but they are taller, larger, and seem a different species to those found on the sea-coast. The camels appear very fond of those we found here, but unless pressed by hunger, they never feed on the latter.

The arák tree* is common to Arabia, to Abyssinia, and to Nubia; is found in many places along the shores of the Red Sea,—and the southern coast of Socotra abounds with it. Its colour is of a lively green, and at certain seasons it sends forth a most fragrant odour. The Arabs make tooth-brushes of the smaller branches which they take to Mecca and other parts of the East for sale.

Tamarisk and acacia trees are also very numerous, and the whole at this period were sprouting forth young branches, and their verdant appearance, after crossing over such a dreary waste of burning sand, was an inexpressible relief to the eye.

At five P. M. we again mounted our camels,—our route continued in a west-north-westerly direction along the valley. It is about one

* Salvadora Persica, called also *siwák* and miswák by the Arabs. It is probably a plant of African origin, being found throughout tropical Africa. From Siwák, pronounced Suag by Dr. Oudeney (Denham's Travels, p. 31), and called nyotút in Senegambia (Adanson's Travels, p. 290), the Arabs have formed the verb *sáka*, he brushed his teeth, and *siwák* or *miswák*, a toothbrush. Its fruit, when unripe, is called *berr*; when ripe, *kebáth*. It is well described by Forskål (Flora Arabica, p. 32) under the name of Cissus Arborea. It is not the Rák of Bruce (Appendix, pl. 44), which is the Avicennia nitida (Delile, Voy. en Arabie de Léon la Borde, p. 81).

and a half mile in width; the bank on either side, and the ground over which we were passing, afford abundant evidence of a powerful stream, having but a short time previous passed along it.

The country also begins to assume a far different aspect. Numerous hamlets, interspersed amidst extensive date groves, verdant fields of jowaree, and herds of sleek cattle, show themselves in every direction,—and we now for the first time since leaving the sea-shore fell in with parties of inhabitants. Astonishment was depicted on the countenance of every person we met, but as we did not halt, they had no opportunity of gratifying their curiosity by gazing for any length of time on us. But to compensate for such a disappointment, one of our party remained behind, to communicate what he knew of us. In answer to the usual queries, who we were? whether we were Musselmans? and what was the nature of our business here? his reply was, that we were Káfirs going to Nakab al Hajar in order to visit, and seek for treasure. Others he gratified with the intelligence that we arrived here to examine and report on their country, which the Káfirs were desirous of obtaining possession of. In vain I endeavoured to impose silence on him, he laughed outright at my expostulation; while our guides, either disliking to be seen in our company, or having some business of their own, left us the instant we arrived near the village.

They returned shortly after sun-set, and we were in the act of halting near to a small hamlet, when the inhabitants sent a message to them, requesting they would remove us from the vicinity of their habitations. Remonstrances or resistance (except on the part of our guides, who remained quiet spectators of all which was passing without an attempt at interference) would have been equally vain, and we were consequently obliged to submit.

It was now dark, and it soon became evident that our Bedowins had but an imperfect idea of the road, for we had not proceeded more than three or four miles, when we found ourselves climbing over the high embankments which enclose the jowaree fields.

The camels fell so frequently while crossing these boundaries, that the Bedowins at last lost all patience, took their departure, and left us with an old man and a little boy, to shift for ourselves. I should have cared the less for this, if before they left, they had had the goodness to let us know to what quarter they had intended to proceed,—but this they had not condescended to do, and we were consequently preparing to take up our quarters in the fields when we unexpectedly came across an old woman, who without the slightest hesitation, as soon as she was informed of our situation, promised to conduct us to her house. We gladly followed her, but had wandered so far from the path, that we did not arrive there till eleven in the evening.

We found our guides comfortably seated in a neighbouring house, smoking their pipes and drinking coffee. I was excessively annoyed, but it would have availed me nothing to have displayed it.

It appears we had arrived at a sort of caravansera, one or more of which are usually found in the towns of Yemen, as in other parts of the East.

A party had arrived shortly before us, and the house was filled with men, who were drinking coffee and smoking. We therefore requested the old lady (whose kindness did not abate when she heard we were Christians) to remove the camels from the court yard, and there, after a hearty supper of dates and milk, we slept very soundly until about three o'clock, when we were awakened by finding our guides rummaging our baggage for coffee. At any other period I should probably have been amused at witnessing the unceremonious manner in which they proposed helping themselves, as well as the nonchalance they exhibited in piling, without ceremony, saddles, baskets, or whatever came in their way, upon us. But men are not in the best humour to enjoy a practical joke of this nature, when snatching a hasty repose, after a fatiguing day's work—and I therefore, with as little ceremony as they used to us, peremptorily refused to allow them to remove what they were seeking for. As we anticipated, they took this in high dudgeon, but their behaviour, unless they had proceeded to actual violence, could not have been much worse than it had been hitherto, and I therefore cared little for such an ebullition.

Friday, 1*st May*.—Although it was quite dark last night when we arrived here, yet we could not but be aware, from the state of the ground we had passed over, that there must be abundance of vegetation, yet we were hardly prepared for the scene that opened upon our view at day-light this morning.

Fields of dhurrah,* dokhn,† tobacco, &c., extended as far as the eye could reach; their verdure of the darkest tint. Mingled with these we had the soft foliage of the acacia, and the stately, but more gloomy aspect of the date palm,—while the creaking of the numerous wheels with which the grounds are irrigated, and several rude ploughs, drawn by oxen in the distance; together with the ruddy and lively appearance of the people (who now flocked towards us from all quarters)—and the delightful and refreshing coolness of the morning air, combined to form a scene, which he who gazes on the barren aspect of the coast could never anticipate being realized.

At six A. M. we again mounted our camels. We passed in succession the villages of Sahún, Gharígah, and Jewel Sheïkh,

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* Sorghum vulgare. † Sorghum saccharatum.

and at 8h. 30m. arrived at another small village, where we had hitherto been led to anticipate we should find the Sultán; but, to our very great joy, we found upon inquiring for him, that he had set off yesterday for 'Abbán, and we accordingly pushed on.

Several people stopped us on the road to inquire who we were, and where we were going? They saluted us with much civility after the Arab fashion, and appeared perfectly satisfied at the answer our guides now thought proper to give to them, that we were proceeding to their Sultán on business.

We met the only man who recognized us in the course of our journey as Englishmen. He was a native of Hadramaut, and had heard of the English at Shaher. He was impressed with a belief that we were proceeding to purchase Hasan Ghoráb from 'Abdu-l Wáhid.

At 9h. we passed Mansúrah, and Sa'íd, and at 9h. 30m. arrived at Jewel Agil, one of the largest hamlets of the group. Leaving several other villages to the left, we now passed over a hill about 200 feet in height, composed of a reddish-coloured sandstone. From the summit of this, the ruins we sought were pointed out to us.

As their vicinity is said to be infested with robbers, we were obliged to halt at a village, in order to obtain one of its inhabitants to accompany us to them. Our guides, as usual, having gone to seek shelter from the heat of the sun, had left us to make our breakfast on dates and water, in any sheltered spot we could find. The sun was nearly vertical, and the walls of the houses afforded us no protection.

Seeing this, several of the inhabitants came forward, and offered with much kindness to take us to their dwellings. We freely accepted the offer, and followed one to his habitation. Coffee was immediately called for, and it was with some difficulty, by promising to return if possible in the evening, after we had visited the ruins, that we prevented his ordering a meal to be immediately cooked for us.

This, combined with several other instances which came before us on our return, convinced me that if we had been provided with a better escort, that we should have experienced neither incivility nor unkindness from this people.

About an hour from this village we arrived at the ruins of Nakab al Hajar,* and a rapid glance soon convinced me, that their examination would more than compensate for any fatigue or privations we had undergone on our road to them.

The hill upon which they are situated, stands out in the centre of the valley, and divides a stream which passes, during floods, on either side of it. It is nearly 800 yards in length, and about

* Nakabu-l-hajar signifies "the excavation from the rock."

350 yards at its greatest breadth. The direction of its greatest length is from east to west. Crossing it diagonally, there is a shallow valley, dividing it into two nearly equal portions, which swell out into an oval form. About a third of its height from the base, a massive wall averaging, in those places where it remains entire, from thirty to forty feet in height has been carried completely round the eminence. This is flanked by square towers, erected at equal distances. There are but two entrances by which admission can be gained into the interior. They are situated north and south from each other, at the termination of the valley before mentioned.

A hollow square tower, each side measuring fourteen feet, stands on either hand. Their bases are carried down to the plain below, and they are carried out considerably beyond the rest of the building. Between these towers, at an elevation of twenty feet from the plain, an oblong platform has been built, which extends about eighteen feet without, and as much within the walls. A flight of steps apparently was formerly attached to either extremity of the building, although now all traces of them have disappeared. This level space is roofed with flat stones of massive dimensions, resting on transverse walls. It is somewhat singular that we could not trace any indication or form of gates. The southern entrance has fallen much to decay, but the northern remains in almost a perfect state. The sketch on the map will illustrate its appearance and dimensions better than any verbal description.

Within the entrance of this, at an elevation of ten feet from the platform, we found the inscriptions, which are also given. They are executed with much apparent care, in two horizontal lines on the smooth face of the stones of the building. The letters are eight inches in length. Attempts have been made, though without success, to obliterate them. From the conspicuous situation which they occupy, there can be but little doubt, but that when deciphered, they will be found to contain the name of the founder of the building, as well as the date, and purport of its erection.

The whole of the wall, the towers, and some of the edifices within, have been built of the same material, a compact greyish-coloured marble streaked with thin dark veins and speckles. All are hewn to the required shape with the utmost nicety. The dimensions of those at the base of the walls and towers, were from five to six and seven feet in length, from two feet ten inches to three feet in height, and from three to four in breadth. These decrease in size with the same regularity to the summit, where their breadth is not more than half that of those below. The thickness of the wall there, though I did not measure it, cannot be less than ten feet, and, as far as I could judge, about

four at the summit. Notwithstanding the irregularity of its foundation, the stones are all without deviation, placed in the same horizontal lines. The whole has been carefully cemented with mortar, which has acquired a hardness almost equal to that of the stone. Such parts of the wall as remain standing, are admirably knitted together. Others which by the crumbling away of their bases, incline towards their fall, still adhere in their tottering state without fracture. And those patches which have fallen, lay prostrate on the ground in huge undissevered masses.

There are no openings in these walls, no turrets at the upper part,—the whole wears the same stable, uniform, and solid appearance. In order to prevent the mountain torrent, which leaves on the face of the surrounding country evident traces of the rapidity of its course, from washing away the base of the hill, several buttresses of a circular form have been hewn from that part, and cased with a harder stone. The casing has disappeared, but the buttresses still remain.

We must now visit the interior, where we arrived at an oblong square building, the walls of which face the cardinal points. Its largest size, fronting the north and south, measures twenty-seven yards. The shorter, facing the eastward, seventeen yards. The walls are faced with a kind of free-stone, each stone is cut of the same size, and the whole is so beautifully put together, that I endeavoured in vain to insert the blade of a small penknife between them. The outer surface has not been polished, but bears the mark of a small chisel, which the Bedowins have mistaken for writing.

From the extreme care which has been displayed in the construction of this building, I have little doubt but it formerly served as a temple, and my disappointment at finding the interior filled up with the ruins of the fallen roof, was very great. Had it fortunately remained entire, we might have obtained some monument which would possibly have thrown light on the obscure and doubtful knowledge we possess concerning the form of religion followed by the earlier Arabs.

Above and beyond this building there are several other edifices, but there is nothing peculiar in their form or appearance.

From a stone which I removed from one of the walls, the inscription was copied.

Nearly midway between the two gates, there is a well of a circular form ten feet in diameter, and sixty in depth. The sides are lined with unhewn stones, and either to protect it from the sun's rays, or to serve some process of drawing the water, a wall of a cylindrical form, fifteen feet in height, has been carried round it.

On the southern mound we were not able to make any dis-

coveries. The whole appears an undistinguishable mass of ruins. Within the southern entrance, on the same level with the platform, a gallery four feet in breadth, protected on the inner side by a strong parapet three feet in height, and on the outer by the principal wall, extends for a distance of about fifty yards. I am unable to ascertain what purpose this could have served. In no portion of the ruins have we been able to trace any remains of arches or columns, nor could we discover on their surface any of those fragments of pottery, coloured glass, or metals, which are always found in old Egyptian towers, and which I also saw on those we discovered on the north-west coast of Arabia.

Although, as I have before noticed, attempts have been made to deface the inscriptions, yet there is no appearance of the building having suffered from any other ravages than those of time; and, owing to the dryness of the climate, as well as the hardness of the material, every stone, even to the marking of the chisel, remains as perfect as the day it was hewn.

We were naturally anxious to ascertain if the Arabs had preserved any tradition concerning their buildings, but they refer them, in common with the others we have fallen in with, to their Pagan ancestors.

"Do you believe," said one of the Bedowins to me, upon my telling him that his ancestors were then capable of greater works than themselves, "that these stones were raised by the unassisted hands of the Káfirs? No! no! they had devils, legions of devils (God preserve us from them!) to aid them." This we found was generally credited by others.

Our own guides followed us during the whole of the time we were strolling over the ruins, in expectation of sharing in the golden hoards, which they would not but remain convinced we had come to discover; and when they found us as they supposed unsuccessful in the search, they consoled themselves with the reflection that we had not been able to draw them from the spirits, who, according to their belief, keep continual watch over them.

The ruins of Nakab al Hajar, considered by themselves, present nothing therefore than a mass of ruins surrounded by a wall; but the magnitude of the stones with which this is built, the unity of conception and execution, exhibited in the style and mode of placing them together,—with its towers, and its great extent, would stamp it as a work of considerable labour in any other part of the world. But in Arabia, where, as far as is known, architectural remains are of rare occurrence, its appearance excites the liveliest interest. That it owes its origin to a very remote antiquity (how remote it is to be hoped the inscription will determine) is evident, by its appearance alone, which bears a strong resemblance to similar edifices which have been found amidst Egyptian

ruins. We have (as in them) the same inclination in the walls, the same form of entrance, and the same flat roof of stones. Its situation and the mode in which the interior is laid out, seem to indicate that it served both as a magazine and a fort,—and I think we may with safety adopt the conclusion that Nakab al Hajar, as well as the other castle which we have discovered, were erected during that period when the trade from India flowed through Arabia towards Egypt, and from thence to Europe, and Arabia Felix, comprehending Yemen, Sabá, and Hadramaut, under the splendid dominion of the Sabæan or Homerite* dynasty, seems to have merited the appellation she boasted of.

The history of these provinces is involved in much obscurity, but Agatharchides, before the Christian era, bears testimony, in glowing colours, to the wealth and luxury of the Sabians, and his account is heightened rather than moderated by succeeding writers.

This people, before Márbe† became the capital of their kingdom, possessed dominion along the whole of the southern frontier of Arabia. We are expressly informed that they planted columns in eligible situations for trade, and fortified their establishments.

The commerce was not confined to any particular channel; on the contrary, we learn from an early period, of the existence of several flourishing cities, at, or near the sea-coast, which must have shared in it. We know nothing of the interior of this remarkable country, but there is every reason to believe, as is most certainly the case with Nakab al Hajar, that these castles will not only point out the tracks which the caravans formerly pursued, but also indicate the natural passes into the interior.

The inscription which it has been our good fortune to discover, will, there is every reason to believe, create considerable interest among the learned.

This character bears a strong resemblance to the Ethiopic,‡ which in many respects approaches the Hebrew or Syriac,—and when the inscription from Hasan Ghoráb was shown to a learned Orientalist in Bombay, he at once proved the justness of the suggestion, by pointing out an exact similitude between several of the letters. I am not sufficiently versed in Oriental literature to pursue the subject further,—and these few remarks arising out of what has come before me, are offered with much diffidence.

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* The ancient people called Himyarí by the modern Arabs were probably called Homeïrí by their ancestors, as their territory corresponds with that of the Homēritæ of Ptolemy (Geogr. vi. 6).

† The Mariaba of the Greeks (Strabo, xvi., p. 778).

‡ It also has some similitude to the undeciphered characters on the Lát of Fíróz Sháh at Dehlí (As. Res. vii. pl. 7—10).—F. S. Similar characters may also be seen on the pedestal of a small statue in the museum at Bombay.

Nakab al Hajar is situated north-west, and is distant forty-eight miles from the village of 'Aïn, which is marked on the chart in latitude 14° 2' N. and long. 46° 30' E. nearly. It stands in the centre of a most extensive valley called by the natives Wádí Meïfah,—which, whether we regard its fertility, its populousness, or its extent, is the most interesting geographical feature we have yet discovered on the southern coast of Arabia. Taking its length from where it opens out on the sea-coast, to the town of 'Abbán, it is four days' journey or seventy-five miles. Beyond this point I could not exactly ascertain the extent of its prolongation,—various native authorities fixing it from five to seven days more throughout the whole of this extent. It is thickly studded with villages, hamlets and cultivated grounds. In a journey of fifteen miles along it, we counted more than thirty of the former, besides a great number of single houses.

The date groves become more numerous as we approach towards the sea-shore, while in the same direction the number of cultivated patches decrease. Few of the villages contain more than from one to two hundred houses, which are of the same form, and constructed of the same material (sun-baked bricks) as those on the sea-coast. I saw no huts, nor were there any stone houses, although several of the villages had more than one mosque, and three or four sheiks' tombs.

More attention within this district appears to be paid to agricultural pursuits than in any other part of Arabia I have seen. The fields are ploughed in furrows, which for neatness and regularity would not shame an English peasant. The soil is carefully freed from the few stones which have been strewn over it, and the whole is plentifully watered morning and evening by numerous wells. The water is drawn up by camels, (this is a most unusual circumstance, for camels are rarely used as draught animals in any part of the East,) and distributed over the face of the country along high embankments. A considerable supply is also retained within these wherever the stream fills its bed. Trees and sometimes houses are also then washed away, but any damage it does is amply compensated for by the muddy deposit it leaves,—which, although of a lighter colour, and of a harder nature, is yet almost equally productive with that left by the Nile in Egypt. But beyond what I have noticed, no other fruits or grain are grown.

Having now made (during the short time we were allowed to remain) all the necessary observations on the ruins, and the surrounding country, our Bedowins, as evening was approaching, became clamorous for us to depart.

About four P. M. we finished packing our camels, and travelled until near sunset, when we halted near one of the villages.

Our reception here was very different from that which we on our journey from the well experienced at the first village. About fifty men crowded around us; their curiosity, though much heightened by all they saw about us, was restrained within the bounds of good taste. Such questions as they put to us respecting our journey were proposed with a degree of delicacy, which surprised and pleased me. Milk, water and firewood were brought to us almost unsolicited, for which we had nothing to return but our thanks. I much regretted on this occasion being unprovided with some trifling presents, which we might have left as a memorial of the Englishman's sojourn among them.

What a different impression we might have formed of this people, had we drawn our opinion from our guides or our first reception amidst them!

Saturday, 2nd May, we started shortly after midnight, and travelled until four, when finding we had lost our way, we halted until day-light. At this time a heavy dew was falling, and Farenheit's thermometer stood at 58°; it was consequently so chilly, that we were happy to wrap ourselves up in our boat cloaks.

At 8h. we again halted at the well to replenish our skins, previous to again crossing the sandy hillocks, and then continued on our journey. From nine A. M. this morning until 1h. 30m. we endured a degree of heat I never felt equalled. Not a breath of wind was stirring, and the glare produced by the white sand was almost intolerable. At 2h. our guides were so much exhausted, that we were obliged to halt for an hour. At 5h. 30m. we arrived at the date groves, near to 'Aïn Abú Mabuth, where there is a small village and some fountains of pure water about fifteen feet square and three deep.

At 7h. we arrived at the beach, which we followed until we came opposite to the vessel. It was however too late to care about making a signal to those on board for a boat, and I was moreover desirous, from what we overheard passing between the Bedouins, who were with us, to defer our departure until the morning. Any disturbance we might have with them had better happen then, than during the night. We therefore took up our quarters amidst the sand-hills, where we could light a fire without fear of its being observed by those on board.

It will readily be believed that if we felt fatigued, it was not without reason. We had been but seventy hours from our station at Bá-l-haff, during which we had been forty-four hours mounted on our camels. The whole distance, 120 miles, might have been accomplished, on a quick camel, in half that time,—and it was the slow pace during the excessive heat of the weather at this season which formed the most toilsome and tedious part of the journey.

May 3.—We were discovered at an early hour this morning from the ship, and a boat was immediately dispatched for us. Strengthened now with the boat's crew, we settled with the Bedouins, without any other demand being made on us, and in the course of a few minutes we were on board the vessel, where we received the congratulations of all on our return. Considerable apprehension had been entertained for our safety, when it was discovered that Hamed had not accompanied us.

The success which has attended this brief journey to the interior will, it is hoped, prove an inducement to others to follow up our researches. Had I been differently situated, I should have proceeded on to 'Abbán, on the road to which there are at a village called Eïsán, ruins of nearly equal magnitude with Nakab al Hajar. But independent of these ancient monuments, in themselves—far more than enough to repay the adventure,—the condition, character, and pursuits of the inhabitants, the productions, resources, and nature of the country, severally furnish subjects of peculiar interest, and would, there can be no doubt, amply repay the curiosity of the first European who should visit them.

I imagine, to proceed, nothing more would be necessary than for an individual to procure a letter from the British government to the Sheikh of 'Abbán. A guard could there be sent to escort him from the sea-coast, and he could from thence be forwarded to the next Sheikh by a similar application.

By the assumption of a Mohammedan or even a medical character, and by sacrificing every species of European comfort, he might, I have very little doubt, penetrate to the very heart of this remarkable country.

IV.—*Extracts from Notes made on a Journey in Asia Minor in* 1836. By W. I. Hamilton, Esq., F.G.S. Communicated by W. R. Hamilton, Esq., F.R.S. Read December 12, 1836.

[The following pages are extracted from the private letters of Mr. Hamilton, written during his travels in Asia Minor and Armenia, in the course of the year 1836. They have been selected chiefly for the geographical information they contain respecting parts of the country which are nearly blank on our maps, or what is worse, which are erroneously laid down. They are accompanied by a sketch map of part of his route, but not by a general map, as Mr. Hamilton has not yet sent to England sufficient data wherewith to construct it. For the present, the map of "Turkey in Asia," by Mr. John Arrowsmith, published in 1832, will be found by the reader the most useful for reference.]

March 2, 1836.—In company with Mr. Strickland, I left Constantinople, and crossed the sea of Marmora in a four-oared caique to Múdánieh, and thence by land to Brúsah, where we

remained to see its hot baths and springs, in one of which, at the source, the thermometer rose to 184° Fahr.; also to enjoy the extreme beauty of its situation, to luxuriate in the first budding of the spring, and to gain, if possible, some information respecting the means of getting to Azáni by following the banks of the river Rhyndacus, which we wished to trace; and although so near, it was extraordinary how difficult it was to obtain any intelligence. It is true that hardly any of the places are mentioned in the map, and the few that are so are extremely faulty. We at last found out that there was a place called Kermaslú, twelve hours from Brúsah, on a river which falls into the lake of Apollonia, and for that we determined to start the next day.

March 26.—We halted at a village called Hasan Agáh, nearly due west from Brúsah, where, after some trouble, we got lodged in a stable. The next morning our course was west by south: we soon came upon the lake of Apollonia, and continued the whole way along its southern shore, continually, but in vain, expecting to come upon the Rhyndacus, and we at last reached the end of the lake without finding the river. We afterwards discovered that the river, flowing from the south-east, passes the lake, from the south side of which it is separated by a range of hills, and flows with a winding course into and through the plain on the west of the lake, which it enters from the west instead of the south, as represented in some maps. In Cramer's map the Rhyndacus enters the lake from the east, and another river, which does not exist, enters it from the south. At Kermaslú we paid our respects to the Agáh, formerly Páshá of Erz-rúm, who was most civil to us, sent us an excellent Turkish dinner to our khan, and told us of the ruins of a large town at a place called Hamanlú, about one hour off. Thither we started early the next morning, and found some small remains of solid walls, with the ground to a great extent covered with fragments of pottery and tiles, but no appearance of marble or columns. Had it not been for the quantity of pottery on the ground, I should have supposed the ruins to be Byzantine: at all events, here must have been a town, and it may have been Pæmenenus (see Cramer, vol. i. 56). The same day we got to a small village called Kerteslek, four hours farther up the Rhyndacus, where we were again most hospitably received and lodged by the Agáh, and got a route to take us to Taushánlú,* a place mentioned by Keppel as being on the Rhyndacus. Here we saw the remains of a castle perched upon a hill, commanding the pass of the river, probably Byzantine, and one of those said to have been erected in the middle ages to defend the passes of Olympus against the Turks.

* lú (with the French *u*), or li, is a derivative termination answering to our *an*, *ian*, or *ish*.—F. S.

March 28.—A long and tedious march over high hills and through fine woods brought us to Adranós, not Edrenós or Edreneh, as the maps give it. Here we heard of two ruins, one of which proved to be a Byzantine fortress, close to the Rhyndacus, the other as clearly the remains of an ancient town, situated at the foot of a limestone hill on the left branch of the river, about two miles from the bank. We found the remains of a large square building, 88 paces by 65, of huge massive hewn stones, put together without cement, the wall in part standing, about thirty or forty feet high, with the remains of smaller walls inside; perhaps a gymnasium. Outside were heaps of stones, with very beautiful sculpture, Ionic and Doric, marking the sites of two temples; numerous columns built into the walls of the adjoining fields, and scattered about amongst the ruins, with traces of walls in other directions. There can, I think, be no doubt that these are the ruins of Hadriani, which I believe have never been visited. In the adjoining village of Báj, two miles off, we found several Greek inscriptions, which we copied (as well as the troublesome curiosity of the villagers, who had never seen a Frank before, would allow us): none of them, however, contained the name of the town. We continued our route at some distance from the Rhyndacus on the left bank, until we came to a village called Ahábij Hisár, where we again crossed it in the midst of beautiful rocky scenery, at a narrow gorge, where is another Byzantine castle. The ruins of Hadriani detained us so long, that we could not reach Hermanjik, where we were to change horses, until the middle of the next day. Our course was generally south-west.

March 29.—We slept at a miserable village called Haïdar, where we were however most hospitably received by the inhabitants, and well fed, as strangers sent by Providence, whom it was their duty to assist. Their curiosity, however, was rather troublesome: they had never seen Franks before, and they completely filled our little cabin. We had great difficulty in ridding ourselves of them; but their behaviour was respectful, and very superior to what one would have met with among the same class of people in some more enlightened countries. There is a dignity about a Turkish peasant quite surprising, and they are a peaceable, ignorant, and inoffensive people. They take no notice of a hint that you wish to be alone: you must turn them out almost by force, and sometimes threaten to complain to an Agáh, on the strength of a firman; but they make no resistance.

March 30.—We left Haïdar early, and in a short time came again upon the Rhyndacus, which we crossed, flowing from east to west: after ascending its course for some way we struck up a

lateral valley on the right, and reached Hermanjik, where we got fresh horses and started for Tausháńlú, eight hours distant, but over a mountainous road. We slept this night at Eshekői* on the top of a ridge of hills. The cottages or rather huts are all built of logs, and roofed with split deal. The cold was severe.

March 31.—We were in a snow storm for some hours, passing through a fine forest with beautiful scenery. Our course was chiefly south-east and east. In about three hours and a half we came to some sepulchral chambers cut in the rocks on the left hand side of the road. They appear to be Phrygian in character; one only remains tolerably perfect: it was probably the Necropolis of some Phrygian town, but we could not hear of any ruins in the neighbourhood. At Tausháńlú we copied several inscriptions, but none of much importance.

April 1.—At Tausháńlú we had crossed the Rhyndacus. To-day we crossed it again, and continued our route over some high hills to Azani, not the same road as Keppel took, but more to the westward. Before reaching Uránjik we descended into the fine rich plain of Azani, but without a tree. A march of an hour and a half brought us to the ruins of Azani, and its beautiful Ionic temple. Keppel was mistaken in supposing that he crossed the Rhyndacus several times between Uránjik and Azani: the river is not near the road. Uránjik is situated north-west from Azani, and the Rhyndacus, after leaving Azani, flows north-east. We however crossed several streams running down to the Rhyndacus, but all flowing in the same direction about east-north-east. The ruins of Azani are also on the left bank of the river, and not on the right.

April 2.—Halt at Azani. The ruins are so well described by Keppel, that I need not repeat them. We were struck with their extent and beauty. Great numbers of columns, blocks of marble, and inscriptions are scattered about: we did not copy the long one on the temple, this being already done by both Keppel and M. Texier, but we employed ourselves in searching for more, and found several. One is the transcript of a letter from Nero, dated Rome.

April 3.—To Gediz,† eight hours. We crossed the Rhyndacus several times up to the sources, following, I believe, one of the longer branches, if not the longest. The situation of Gediz is very extraordinary, but the river which flows through it is decidedly not the Hermus, but only a tributary stream which

* kői, village, is pronounced kïeuï by the Constantinopolitan Turks, the ő having the sound of the German ö, and French *eu*.—F. S.

† From this place, which is properly Gedúz, anciently Kodús or Kadős, the ancient accusative Cados, for this place is on the site of Cadi. The Turks call this Hermus Gediz or Kedúz-sú, i. e. Kediz water.—F. S.

falls into that river, about three miles lower down. The real Hermus, even here, is a very considerable stream, flowing from the east, though it is indicated in Cramer's map as a small stream; and it flows from Murád Tágh, which is situated, not where the maps both of Leake and Cramer place it, but to the eastward. It is curious at Gediz to see how the river, instead of flowing right down the valley by the lowest level, works its way through a narrow chasm above 200 feet deep, and not 10 feet wide at the bottom, which appears to have been rent by an earthquake through the solid basaltic rock.

April 4.—Gediz to 'Usháḳ, called eight hours, but really above ten. We were led to 'Usháḳ in the hopes of finding some ruins there. A beautiful ride over a mountainous and untravelled district; trap and basaltic rocks burst up in several places, and we found some beautiful varieties of obsidian.

April 5.—Reached 'Usháḳ, a large town famous for the manufactory of Turkey carpets, which are sent to Smyrna. It is the place where all the best and largest are made. We were very anxious to see the process, but there was an insuperable difficulty, that they are made by women, whom we could not be allowed to set eyes upon. However, a house was found, where the women were to be sent out of the way, and we were then admitted; an old gentleman showed us the process. It is very rude and simple, worked in the open air, and in the coarsest of frames. There are several inscriptions at 'Usháḳ in the wall of the mosque, and other traces of antiquity, which are given by Arundel, but he did not know where they came from. We were told that they were all brought from a village called Ahadkói, six miles due east from 'Usháḳ, where also there were said to be considerable ruins. Thither we determined to proceed, and from thence to make a détour round to the south by Clanudda? to Kúlah in the Katakekaumene. We halted for the night at the village of Súsús, five hours from 'Usháḳ, near the banks of a large river called the Banás-chái, which flows from Morád Tágh* south into the Mæander, which brings this branch of the Mæander much more to the north and east than any of the maps have given it. On our way we found many inscriptions on the walls of the mosques, which we copied, and which it is fair to presume came also from the ruins we were in search of, in one of which we were fortunate enough to discover the name of our town, should it really prove an ancient site.

April 6.—One hour's ride brought us early to Aḥadkói,† where,

* The Turks usually say Dágh, though they write Tágh.—F. S.

† Ahád-kói, Village-one. The final consonants in Turkish are always pronounced as *Surds*.—F. S.

on the summit of a hill, we saw the remains of some ancient building, to which we immediately ascended. It proved to be a theatre, with half the scena and proscenium standing, built of very large blocks of stone. All the seats of the cavea are gone, but the hollow clearly remaining. Farther search on the Acropolis brought to light another theatre, and the foundation and ground-plan of a small temple; besides tracing the walls of the Acropolis in several places. About a quarter of a mile from the village, we had also discovered the site and part of the foundations of another temple; architectural ornamented sculpture lying about in every direction, and many inscriptions, but chiefly sepulchral. I believe these to be the remains of Trajanopolis. One of these inscriptions is I believe the first in which the name of this town is given (see Cramer, ii. 59). Having satisfied our curiosity here, we started for Segider, four hours distant, almost due south. Arundel was here, and decided that it must have been an ancient site, which appears to be the case, from the number of marbles, &c. in the village and burying-ground; but he could not make out the name of the place. It appears from an inscription lying in front of the mosque to have been Sebaste. There are also two tumuli south from the town.

April 7.—Segider to Kóbek, or Góbek, seven hours. Our course nearly east, the country one continued plain, but cut up and intersected by very deep ravines and valleys, which are sometimes excavated to such a depth as to make a person travelling in the valleys imagine himself in a mountainous country. To use the term of a German philosopher, they are only negative mountains. We again crossed the Banas-chaï river flowing south about two hours from Segider. The rest of our route was uninteresting. At Kóbek we searched for inscriptions, but could only find one in the burial-ground, said to have been brought from the ruins of Suleïmánlú, named by Arundel Clanudda, for want of a better. Our inscription, however, was worth a dozen, as it gave us the name of the place.

April 8.—A guide took us in two hours to the interesting ruins of Suleïmánlú: their situation is striking, the Acropolis being formed by the junction of two ravines excavated in the great plain, which I have just described, and which consists entirely of a soft crumbling limestone, with a few harder beds intervening. The ruins are partly described by Arundel: he talks however of some arches outside the gate. These are evidently the remains of an aqueduct, crossing some low grounds. We traced it for some way along the hills on our way to Takmák and Kulah: From hence we started for Takmák; but our guides lost their way, and instead of keeping to the south of a mass of black-looking volcanic hills, we wandered through the middle of them by bad roads,

and were obliged to halt for the night at a Yuruk* farm, where, as often happened, we shared the same building with the horses.

April 9.—A dreary ride of one hour and a half brought us to Takmák, where the Agáh, to whom we presented ourselves, was very civil, but could not procure us as many horses as we wanted till the next day. He however ordered our guides to take us to Kulah, eight hours further, but which it was impossible to do the same day with tired animals, the hour being about three miles and a half: we contrived however to make about half the distance, and halted at a wretched village called Aktágh, in the neighbourhood of which were many Yuruk tents.

April 10.—Across a fine rich country; reached Kulah about 11 A.M. A mile from the town we suddenly came in sight of its black conical volcano, from the summit of which we had a splendid view: several other volcanic cones in sight, but of a much older date, their sides being considerably melted down, and cultivated to the very summit. We were now fairly in the Katakekaumene, and were much struck with the resemblance the country bears to central France; so much so, that it is an additional satisfaction to us that we took that route in coming out. This lava stream, flowing first to the south, is checked by low outlying hills of Mount Tmolus, and has then turned to the west, and flowed north into the valley of the Hermus, which appears far off, winding its way through a number of contiguous tablelands, the remnants of a former plain through which the Hermus has made a channel some hundred feet deep, and produced another set of negative mountains, which appear at this distance to be capped with basalt, the product of the still more ancient volcanic period; but that is a subject for future investigation. I also heard of several ruins in the neighbourhood, food for a future journey.

April 11.—Kulah to Adula, eight hours. We passed through a great deal more of volcanic country, to the examination of which I hope to devote some other opportunity. We could not however stop long at Adula. We crossed the Hermus, and were much surprised, thinking ourselves quite out of the Katakekaumene, to find a stream of black lava flowing behind the town, and out of a narrow gorge, through which the Hermus also flows. Water and time have, however, conquered the lava; and the continued stream of the river has in the narrow part of the gorge almost obliterated all traces of the lava, over which it must have once flowed. We were now in the plain of the Hermus, and in quite a different climate: the vegetation a month in advance of the places we had come from.

* Yuruk signifies "wanderer," or "migratory, and is exclusively applied to the Turkomán hordes who live in tents, in the hills in summer, in the plains in winter. They are a harmless, hospitable people; but their numerous large and fierce dogs are a great annoyance to travellers.—F. S.

April 12.—Adula to Sardes, nine hours, going by the Gygæan lake, and the tomb of Halyattes. Our journey the whole way was through the rich plain of the Hermus, scattered with the black tents of the wandering Turcomans, and their numerous herds and flocks. We spent so much time wandering over the ruins, and scrambling up a break-neck road to the crumbling pinnacles of the Acropolis, that we were unable to get beyond Sardes, to-night, although not the regular post station. On the summit of the hill are some remains of a castle, which must, I think, be Byzantine, being entirely composed of beautiful specimens of sculpture, columns, architraves, and friezes. Capitals and pedestals are stuck into the wall with great irregularity, the fragments of Pagan temples. The most striking feature in the Acropolis, or rather in what was the Acropolis of Sardes, is the destruction of the sandy soil by the continual abrasion of torrents and of water, worn into fantastic shapes of pinnacles and minarets, turrets and battlements. The ancient summit is gone: nothing now remains but a narrow ridge and detached pinnacles, with almost perpendicular sides, which are only preserved by fragments of broken walls, which also are in part undermined.

April 13.—We left Sardes early, travelling along the foot of Mount Tmolus, the Kiziljah Músá Tágh* of the Turks, on our left, the base of which is girt with low sand hills; the detritus of the mountains, now in their turn crumbling away, and carried down by the Hermus into the gulf of Smyrna. On our right the Hermus and its plain, and beyond, the Lydian Necropolis of Sardes. We counted about sixty tumuli, three of them of large size, and before we reached Kasabah,† saw several more on the south side of the river, close to our road. We passed also several caravans of Yuruks wandering from station to station. In the winter they unite in the great plains beyond Kútáhyah: in the summer they spread themselves all over Asia Minor. Reached Smyrna in the evening.

Having been induced to visit Constantinople a second time, and from thence to go by sea to Trebizond, on the 20th of May, at two P. M. I entered the Euxine on board the Essex Steamer, and soon passed a fine mass of basaltic columns near Cape Kará Burún. The scenery of the shore, wherever we were near enough to judge, was very fine, the bold steep hills covered with large

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* Reddish Moses-Mount.—F. S.

† Kasabah is a corruption of the Arabic word Kasbah, "market-town:" the proper name of the place is Durghút-li Kasabah, the town of the Durghút horde, one of the original Turkomán tribes who established themselves in Asia Minor in the twelfth and thirteenth centuries.—F. S.

forests, and much broken up into precipitous ravines and rocky valleys.

May 21.—I was much struck with the fine bold appearance of Mount Saghrah, terminating to the north-east with a steep and lofty cliff appearing far above the high chain of hills on the coast.

May 22.—On coming on deck, I immediately recognised the remarkable position of Sinope, with its bold headland, and the fortified town occupying the low and narrow isthmus which connects the headland with the main, about ten miles ahead: we were then passing along under the low black volcanic-looking cliffs of Mount Lepte. About forty miles east south-east of Sinope we passed close to a long narrow neck of low land, thickly and beautifully wooded, stretching out far into the sea; at the extremity of which we could distinguish the mouth of the Halys. A large volume of yellow muddy water must be here discharged, for the sea is much discoloured to a distance of several miles. The next near land, which we made was on the following morning, when we passed round Cape Jeróz. Unluckily the weather changed to rain, and prevented our fully enjoying the beauties of the coast from this point to Trebizond. Nevertheless, as we approached, we were much struck with the situation of the place. It is built on a range of undulating ground, at the foot of high steep hills, which rise immediately behind the town. Many of the houses are surrounded with trees and gardens, which, added to its situation, give it a most agreeable appearance. The Vice-Consul has been most hospitable to us, having taken into his house as many of us as it would hold. To-day I have been rambling about over the town, and its interesting and picturesque ruins and walls, which are clearly Byzantine,* but which the Turks, perhaps through jealousy of the Greeks, call Genoese. They are very extensive, but I do not think any thing can be traced which can be attributed to an older period. The situation of the walled part of the town is very picturesque, with its ivy-clad, battlemented walls, overhanging deep-wooded ravines on each side, over which high and narrow bridges lead to the narrow and complicated gates of the town. I also mounted to the summit of a high hill behind the town, which, from its position and apparent lines of old fortifications, appears to have been the Acropolis of the ancient city. From Trebizond we travelled by the usual road to Erz-rúm.

Being unwilling to quit Armenia without visiting Kars and the ruins of Anní, I left Erz-rúm on the 7th of June; slept that night at Hasan Kal'eh, a small town on the Aras, or south-east branch of the Araxes, and six hours from Erz-rúm.

* Vide Journal R. G. S., vol vi. p. 189.

June 8.—We proceeded to Khorásán, a distance of eight hours, or twenty-four miles: our direction being chiefly east north-east; for three hours our route followed the well-known high-road to Persia, through Kópri Kói;* a short distance beyond which village, we struck off to the north-east, leaving the Persia road at a handsome bridge of seven large arches across the Aras. Our road continued through a flat uninteresting country, along the left bank of the Aras, as far as Khorásán, where we halted for the night. As yet we had not seen a single shrub or tree since we left Erz-rúm.

June 9.—We marched from Khorásán to Bárdis, ten hours, or thirty miles. After a few miles we left the valley or plain of the Aras, and ascended the winding valley of a tributary stream, which flows from the north, and reached the summit of a bleak and lofty chain of mountains. On some of the hill-sides to-day we saw a few clumps of firs, but they are extremely scarce. On our right, however, was, although out of sight, the great forest of Sughánlú Tágh, from which both Kárs and Erz-rúm are supplied with fuel and timber. From the summit of this mountain chain we descended into the valley of Bárdis, the river of which flows through wild and rocky glens and picturesque scenery to the north, and afterwards turning to the east falls into the Arpah Chái†, or northern branch of the Araxes, which forms the boundary between the Russian frontier of Georgia, and Turkish Páshálik of Kárs. The village of Bárdis is now an inconsiderable place, although formerly defended by a castle built by one of the sultans, which commanded the only road from the Russian frontier to Erz-rúm, and by which the Russian army marched during the late campaign.

June 10.—Bárdis to Kárs, twelve hours, or thirty-six miles. The first two hours the road leads through a fine wooded mountainous region, being the northern extremity of the tract of country called the Sughánlú Tágh. Our course nearly due east. After crossing the mountain chain, consisting principally of basaltic and igneous rocks, we descended into a plain running east and west, and watered by a small river, which, after receiving numerous small mountain rills, passes through the town of Kárs, and thence falls into the Arpah Chái, to the north of Anní. Our road led us along the northern side of the plain, skirting the base of the hills on our left, and occasionally passing over the spurs of the hills, which run far out into the plain. The soil is rich, and is cultivated wherever a sufficient supply of water will permit of irrigation. This process seems indispensable to the raising of a crop throughout the whole of this elevated plateau of Armenia, which

* Bridge Village.—F. S. † Barley-water.—F. S.

is said to be at least 6000 feet above the sea. The town of Kárs is situated in a low amphitheatre of hills, at the base of this low chain, and at the spot where the river, by some extraordinary effort of nature, has forced through a narrow rocky gorge to the north, instead of continuing its course through the lower undulating plain to the eastward. Kárs is by no means the strong military position which some have alleged it to be. It is true, the castle, situated upon a scarped rocky point, with the river flowing round its base, and presenting an almost perpendicular front on three sides, would be a strong place against Kurdish lances, or the bows and arrows of former times; but against the artillery of modern days, both the castle and the town, being completely commanded by the range of hills to the north and north-west, and having no defences at all on the side of the plain towards the south, would be absolutely untenable.

At Kárs we were well received by the Káïm-makám or Deputy-Governor during the absence of the Páshá, who furnished us with necessary guides and letters for the authorities, through whose villages and territories we should pass on our way to Anní; he advised us, however, not to sleep there, but at a village a few miles before reaching that place. We accordingly halted, the first night after leaving Kárs, at a miserable village called Hájí-Velí-Kóí* five hours due east from Kárs. The country over which we passed was generally slightly undulating. The rock, wherever it appears, either above the surface or in the ravines, is a hard cellular lava, at times slightly columnar. A few conical hills scattered over the plain may be the remains of craters, from which these streams of lava have flowed.

June 14.—We started at an early hour: the country resembled that between Hájí-Velí-Kóï and Kárs. In about an hour's time, after travelling to the east in order to get round some hills to the south-east, our course changed a little to the east-south-east, and we suddenly found ourselves in sight of Agrí-tágh,† or Mount Ararat. It is impossible to describe the effect produced by this stupendous mountain rising in majestic and solitary grandeur far above the surrounding hills and mountains. The morning was beautifully clear, the sun just risen, and not a cloud or particle of vapour obscured its striking outline. It is impossible to look upon this mountain pass, so impressive of majesty and antiquity, so interestingly connected with the early history of the human race, without mingled feelings of awe and wonder. About six o'clock we came in sight of the ruins of Anní.‡

* Pilgrim Velí's Village. † Egri tágh, crooked mountain ?—F. S.

‡ Mr. Hamilton's description of the ruins of Anní will be found in the 1st vol. of the Transactions of the Institute of British Architects, 1836.

June 17.—On my return to Kárs I separated from my companion Colonel Mackintosh, who had accompanied me to Anní and Gúmri, and who continued his journey into Persia, whilst I determined to find my way, if possible, to Trebizond by another route, across the wild mountains of Lázistán. From Kárs I retraced the first day's journey by the road from Erz-rúm as far as Bárdis. The greater part of the rocks over which I travelled in this day's journey are volcanic. Igneous rocks abound in the whole of this elevated country, and high mountain ridges. We might have fancied that the accounts of mountains and palaces of glass belonged only to such fables as the Arabian Nights. To-day, however, I passed round the foot of a mountain of glass, and where the roads were paved with the same material. It was, in fact, obsidian, or volcanic glass, most perfect and uniform in its grain.

June 18.—I left Bárdis and entered a new and unknown country. The whole day my road was through rich wild rocky valleys, sometimes winding along the edge of the torrents, and sometimes climbing round crags rising precipitously a hundred feet above the stream, where a path more like the track of a mountain goat than a horse-road has with difficulty been scooped or scraped. Sometimes a rocky staircase leads to the point of a projecting rock, where a sudden turn in the path shows a winding goat-path almost perpendicularly below you. With the steep rocks on one hand rising close, and the deep precipice on the other without a parapet or defence, there is no room to dismount from your horse, to whose legs you are unwillingly compelled to trust yourself, instead of your own. That night I reached It, a small village in the middle of a well-cultivated plain; a distance of eleven hours, or thirty-three miles, but I should think not much more than half in direct distance, owing to the winding nature of the road, up and down different valleys in order to cross the mountain ridges by the easiest natural passes. I was five days reaching Tessis, situated on the banks of the Chórúk-Sú, which flows past Báïbút* and falls into the sea near Batúm, close to the Russian frontier.

June 19.—I went from It to Lísgaf, all small villages, and crossing another high mountain-chain we proceeded through one of the wildest and rockiest gorges I ever witnessed, to the beautiful vale of Tortúm. The wildness of this mountain pass is not to be described; high perpendicular cliffs of 1000 feet rise from the bed of the rapid torrent. In many places there is no road on either side, and the bed of the river is the only path. The valley of Tortúm is a perfect Oasis. Fancy a beautiful narrow valley, with high rocks on each side, the bottom richly planted with every

* Or Báïbúrt.

variety of fruit-trees, and a clear rapid stream dancing over the white marble rocks at your feet, suddenly opening to the sight after wandering for days over barren mountains, with scarce a gloomy fir-tree to be seen. The effect was quite magical, particularly whilst wandering along the road, under its grateful shade, after the scorching sunbeams of the morning. What a contrast was our halting-place for the night! I had intended remaining at Tortúm; but the Agáh, on whom I called after the most approved system of Turkish hospitality, strongly recommended my going on two hours farther to a village, where I should find plenty of horses and good accommodation. I trusted him, and he actually had the barbarity to send me to a miserable Yaïlá,* or collection of huts used in the summer, on the mountain, in a dreary waste, where I passed the night amidst snow, clouds, and rain.

June 20.—I reached Tessis, crossing another high mountain-chain—here is a curious old castle commanding the pass through which the Chórúk-Sú flows. Hence I returned by Báïbút to Trebizond.

July 7.—I again left Trebizond on my journey along the coast to Sinope,† in which I have been disappointed in antiquities, but in geography I have been able to clear up many points, in which Cramer is mistaken, or the discrepancies of ancient authorities have made it impossible to draw any conclusion without personal inspection.

For the following remarks I must refer you to Cramer's map and work on Asia Minor:—

1. Cerasus. There is no doubt that the place, to which Xenophon marched in three days from Trebizond was between the Hieron Oros and Cape Coralla; but it is not, as Cramer supposes, at Iskefíyeh. There are no remains of any town, but there is a river which still preserves the ancient name in that of Kerahsún, which is about four miles to the west of the river Iskefíyeh.

2. Tripolis, now Tírehbólí. This town is not at the mouth of the great river, which descends from Gúmish Khánehǂ and Zogana, but about three miles to the westward. At the mouth of the river, however, are some silver and copper mines, which were rich, and extensively worked, until the water got in about thirty years ago. These mines are probably the Argyria of the ancients, and the distance agrees well with the twenty stadia, the mines being also on the west or left bank of the river.

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* Yaïlá or Yaïlák, in Turkish, signifies the summer, and Kisheá or Kishlák the winter-quarters of the wandering Turkomán hordes.—F. S.

† Sinopé may be said to retain its ancient name, as it is written Sínúb, but pronounced Sínúp by the Turks.—F. S.

ǂ Silver-House.

From Tírehbólí to Kerahsún or Pharnacia I went by water, the road by land being almost impassable and very mountainous. I landed for a few minutes on the island of Arctias, but found no traces of the temple of the Amazonian Queens.

3. Kerahsún. Here are very considerable remains of the old Hellenic walls, on which Genoese or Turkish walls have been built, following the same line across the promontory. From Pharnacia to Ordú, where Cramer places Cotyora, I crossed amongst others the rivers Pharmatenus and Melanthius, both of which are recognizable by their size. Wishing to see Cape Jasonium, I went from Ordú to Fátsah by water, the road not keeping along the coast, as had hitherto been the case. I was fortunate enough to make out the island of the Cilicians, as it is called by Arrian, and the existence of which Cramer (p. 273) rather seems to question. I landed on Cape Jasonium in time to get a meridian observation. I was told to expect extensive ruins there, but found only the remains of a Greek church. The same disappointment at Polemonium, where, near the mouth of the Sidenus, now called Púlímán-chái, I found only the remains of an old Greek church.

At Uniyeh I halted a day to visit a curious castle on the summit of a perpendicular rock, which I was in hopes might turn out to be one of Mithradates' strongholds, and also to find out, if possible, the iron ore and mines, for which the Chalybes, who formerly inhabited this coast, were famous (Cramer, vol. i., p. 274). With regard to the castle, I can say nothing; for, with all my endeavours, and two sets of guides at different times, I could not get to the summit of the rock. On the south side, in the face of a smooth perpendicular rock, about fifty feet from the bottom, is a very remarkable cave or entrance cut in the solid rock, so as to represent the façade of a Greek temple, with its pediment and architrave, &c.

With the Chalybes I was more successful, as I found their local successors, the Turks, occupied in the same way as their labours of old are described by Apollonius Rhodius, extracting the ore from the metal in the most primitive manner. There are no mines, and the ore is found in small irregular nodules, embedded in a yellow clay, which forms the surface of all the neighbouring hills. It occurs always near the surface, not extending above a foot or two below. There are no large establishments. The metal is extracted in a common blacksmith's forge, of the rudest construction, and worked by a single family, whose hut is close by; and when they have exhausted the ore in their immediate neighbourhood, they move their hut and forge to some more productive spot. The ore does not yield above ten per cent. of metal.

From Unyeh I went to Chár-shambah,* crossing the Thermodon and the splendid plains of that name, with its woods and herds of cattle, and forest of fruit-trees of every description, equalling in richness and fertility, and (for a flat country) beauty, any thing I ever saw. Chár-shambah is situated on the Iris, about three hours from the mouth. Here I halted a day to see 'Osmán Páshá, of Trebizond, the great landed proprietor of all the district of Jáník, and supposed to be the richest individual in the Turkish dominions.

Of Sámsún, my next stage, I have but little to say. Vestiges of the port of the ancient Amisus, and of the walls, can just be traced, and a few coins may be picked up by those who will pay ten times their value. From Sámsún here the road has never been travelled by any one, I believe; and indeed there is little to repay the trouble, except a rich country and fine scenery. But the road between Trebizond and Tírehbólí is almost one continued garden of Azaleas, rhododendrons, myrtles, deep-wooded valleys and high-wooded hills, intersected by numerous streams, and the heat tempered by the frequent rains from the north-west, which are also in part the cause of this splendid vegetation.

At Sinope nothing now is to be seen of its famous temples, gymnasia, porticos, &c.: they are all levelled, and the town is full of fragments in every corner. But the great mine of ancient fragments are the walls, which surround the modern town and citadel. This last is built on the narrow isthmus, and is probably a Byzantine work. The buildings consist altogether of fragments of ancient architecture, columns, friezes, architraves, mouldings, capitals of columns, cornices, &c., all worked in together, to form the fortifications, by the hands of some rude barbarians, for such in reality were some of the Byzantine emperors. Here I found an inscription in good preservation, which has never, I believe, been copied.

Amasia, August 12. My original intention was to have come almost direct hither; but when I had visited the Thermæ Phanarœtarum at Carora, and had unexpectedly fallen in with the Stiphane Palus, though quite in a different district from that in which Cramer places it (for I must still refer you to his map), yet agreeing in every respect with the account which Strabo gives, and exactly at the western boundary of the rich and extensive plain of Phanarœa, which extends from east to west, and not from north to south, I determined, instead of following the usual route to Amasia, to visit this plain of Phanarœa, the junction of the Iris and Lycus, to look for Eupatoria, and to ascend the Lycus as far as Neo-Cæsarea, or Niksar, and thence to cross the mountains to Cæsarea, Comana Pontica, and Tókát, reaching Amasia

* Or Chehár-shambah, i. e. Wednesday the fourth day of the week, from the market held there on that day.—F. S.

by way of Zíleh, all of which I have satisfactorily accomp[lished.]
I was the more tempted to adopt this plan, although it kept me away from Asia Minor Proper rather longer than I had intended, from Amasia being the birth-place of my companion Strabo, who has described the whole of this country with more than usual detail; and the greater part of it lying out of the direct road, has never yet been visited by any traveller for the purpose of exploration; and I think I may now promise you a better map of the course of the Iris and Lycus than has yet been attempted. I was unfortunate in my attempts to discover the ruins of Eupatoria, of which I suspect not a vestige remains; but the situation is so exactly described by Strabo, when you read him on the spot, that it is impossible to overlook it, or mistake where to search for it. The Phanarœa is indeed a beautiful plain, perfectly flat, and bounded on all sides by steep, rocky, and wooded hills: it extends, as I saw, from east to west, being about twelve or fourteen miles long and about five wide, in the broadest part. About the middle of the plain (not the centre) on the northern side, at the foot of a range of steep rugged volcanic hills, the Iris flowing from the west by south, and the Lycus from the east or east by south, unite their waters, and together flow through a deep and narrow gorge, which extends for several miles, until the river emerges in the great plain, which is also watered by the Thermodon. There can be no doubt that this plain (that of Phanarœa) was once an extensive lake, before the waters found a passage through this narrow gorge. The plain in which Níksar is situated, also watered by the Lycus, is of the same character, but separated from the Phanarœa by a ridge of lofty hills, through which the river has in like manner forced a passage. Níksar, however, is strangely misplaced in Cramer's map. Instead of being about seventy miles in a direct line from the junction of these rivers, it is not above twenty-five miles south-east of that spot. It will consequently fall a little to the east of where he places Cabira; and I am convinced, from the situation, distance, and character of the country, and position of Níksar at the foot of the chain of Paryadres, that Cabira and Neo-Cæsarea are one and the same place. Comana Pontica again, if indeed the petty ruins at Kúmenek are to be identified with that town, is also much out of its true position. The latitude of Kúmenek is about 40° 18′ instead of 40° 3′. For its longitude I must rather trust to my log, which I have not yet worked out. All these corrections will, I hope, make it more easy to trace out the old Roman roads. The Daximonitis is another very fine plain, through which the Iris flows to the westward of Tokát, and which it is also impossible to mistake. With Zíleh, the ancient Zela, I was also much interested; the small flat conical hill which is in the centre of

the town, completely insulated in the midst of an extensive flat rich country, is precisely the hill or mound of Semiramis. Unfortunately an ugly fortress of the middle ages, with Turkish restorations, has usurped the place of its beautiful temple: scarcely any remains of antiquity are to be seen there; but I found three fine and well-executed Ionic capitals, worked into the wall of the fortress, besides a few architectural fragments and a bad Greek inscription (funereal, of course).

I reached Amasia yesterday evening, and have seldom seen a more interesting or striking place. I have not yet had time to visit many of its antiquities, not having ascended the castle. The situation of the town, the birth-place of Strabo, is exactly as he describes it, although the greater part of the modern town is what he calls the Προαστεῖον. The most remarkable and striking objects which I have yet observed are the tombs of the kings, excavated in the steep perpendicular face of the rock, on which the castle is built, and immediately under it, on the side towards the river. How, seeing the character of the tombs themselves, their situation with regard to the castle, the portion of the remains of the old Hellenic walls, and with Strabo in one's hand, any one could doubt their being the βασιλέων μνήματα, I am at a loss to imagine. The Iris here flows from east to west. The steep craggy hill on which the castle stands, and the old citadel, is on the left or north bank of the river, from which it rises almost perpendicularly, leaving only a narrow space, on which a few houses are built. It is on the face of this rock that the tombs are excavated, and the old Greek wall extends along the face of the hill *below* the tombs, which are thus between the castle and the wall, and consequently within the Περίβολος. Nothing can be clearer; and yet Cramer, who I suppose has consulted every traveller, who mentions the tombs, seems to doubt the fact. This must be attributed to the imperfect descriptions he consulted. The tombs themselves are precisely of the same character, form and style, as one which is described in Morier's Travels, but they have no inscriptions. They are rendered infinitely more striking, however, from their imposing situation, all five being visible together, on the face of a bold steep rock, about a hundred feet up, instead of being buried under trees, and at the bottom of the rock close to the dusty road, like the other. The face of the rock has been artificially smoothed, to give more effect to the tombs, to which a narrow path, and steps scooped out of the perpendicular face of the cliff, lead; in front of each is a narrow platform, and there are generally a few steps leading up from it to the tomb itself, which, although of the solid rock, is completely detached from it, by a narrow passage which goes round each tomb. The roof is also quite detached.

From Amasia my next principal point was Yúzkát; but as I was anxious to discover the ancient site of Tavium, if possible, I determined to go round by Chórúm, and visit that almost unknown place, which Colonel Leake supposes to represent the ancient Tavium. From Amasia I went to Hájí-Köï, a large village of 300 houses, about thirty miles nearly west from Amasia, and where the roads to Yúzkát and Chórúm branch off. At Chórúm, about ten miles farther due west, I found rather a large town of most bigoted Mussulmans, scarcely a Greek or Armenian in the place, and where, owing perhaps to its insulated position, no one had ever seen a Frank before; nor had the reforms of Sultán Mahmúd yet penetrated thither. I have nowhere seen such fanciful and preposterously large turbans, a sure sign of a Turk's bigotry; nor ever met with such unconcealed scowls and frowns as I did here in walking through the bazaars, and more particularly in the court of the mosque. Chórúm is situated in the middle of an extensive plain, stretching north and south, through which a small stream flows to the south, which afterwards falls into the Iris: consequently, contrary to my expectation, it is still on the eastern side of the chain of hills which separated Pontus from Galatia, and must be reckoned to be still in Pontus. On a low rising hill, to the south-east of the town, are the remains of an ugly square castle built by Sultán Murád, by whom, as far as I can learn from the Turks, whose knowledge of history is not very great, the town was founded. In the walls of the castle are many Greek inscriptions and fragments of columns. Some of the former have been purposely destroyed or obliterated. I copied several, but all are sepulchral and of Christian times. The Turks said they came from a ruined town called Karà-hisár,* about half way on the road to Yúzkát, and from some villages near Hájí-Köï, where I had also found a few others of the same age and style. On my way to Yúzkát I visited Karà-hisár, in the hopes it might prove to be Tavium. The position is striking; in the midst of a high undulating plain, surrounded at some distance by low broken hills, near a steep and lofty mass of black rock. Its almost perpendicular sides lead from a narrow base to a summit pointed and inaccessible. Its height is about 300 or 400 feet from the plain. There are, however, two summits or points of nearly the same height, and not fifty yards asunder, to one of which I was able, with some trouble and difficulty, to ascend. The ruins at the base clearly indicate the existence of an ancient town, and consist of five or six large buildings and remains of the walls; but they all appear to me Turkish. No large blocks of marble were to be seen, no inscriptions; nothing, in short, characteristic of a Greek or Roman site.

* Black Castle.

So far I was disappointed; but whilst looking at these ruins, my Tátár, who is become an excellent antiquary, heard of some curious large "old stones," the name by which all ruins go in Turkey, at a neighbouring village. I immediately started off for the place, and found in the outskirts of a Turkomán village a most curious and interesting monument of very great antiquity. It consisted of the remains of a gateway, either of a town, or of a temple, with about forty feet of wall on each side. The two large blocks of stone which form the gateway are of gigantic proportions, ten or twelve feet high. On the outside of each is sculptured a huge, monstrous figure, too grotesque to be human, and too human to be called anything else. It has a human head of very Egyptian character, the body very shapeless, something between the form of a bird, and that of the pedestal of a Hermes, to which are appended legs with lion's claws. On each side the wall advances about fifteen feet, and then breaks off to the right and left; so that the gateway is thrown back from the line of the wall, which is much ruined; many of the stones of enormous size and of Cyclopean character are on the ground in front. On the lower course of stones, on the outside or south, a rude bas-relief has been sculptured, representing a procession, a sacrifice, and beasts driven to the altar. The relief is very low, and much resembles those on Egyptian monuments, and the figures are rather more than three feet in height. On the second course of stones only one is now remaining in its place; but it proves that a wall has existed, even if the many large blocks on the ground in front were not sufficient proof. Of the bas-relief which I was able to distinguish, the most western stone, to the left looking at the gate, represents children playing upon instruments; the next represents their parents, and the next rams driven to the sacrifice. Further on is a bull, very rudely carved. The sun not shining on them, I was unable to make out the other; and having to ride back ten miles in the evening to where I had left my servant and baggage, I had only time to make a hasty sketch. I had been told the road was so bad, and there was no accommodation, that I had been persuaded to leave the baggage, &c. at a village on the road from Chórúm to Yúzkát, and had ridden off with only the Tátár and a guide; otherwise I might have spent a day well in copying more carefully this interesting monument. From hence I went to Yúzkát, nearly ten hours south of Chórúm, where I could not discover the slightest vestige of antiquity. The town is a new creation, and was founded by the father of the famous Chapán O'ghlú, about eighty years ago, having been previously only a small Turkomán village. Here I was obliged to leave my servant, to recover from an attack of fever, whilst I made a four days' excursion to visit Bógházkói (M. Texier's discovery) and

Nefiz-kọ̈i, where I had been told I should find considerable ruins. Both the places are six hours distant from Yúzkát, Nefiz-kọ̈i being six hours to the west,* and Bógházkọ̈i the same distance to the north-west. I was in hopes of finding Tavium at one or the other, and returned with the full conviction that Bógházkọ̈i represents the ancient Tavium. I will not now enter into the detail of distances founded upon the ancient itineraries, and my own observations and maps, which I think satisfactorily prove the identity of the sites, and on which I have written a short memoir.†

The modern village of Bógházkọ̈i is situated near the mouth of a narrow defile, and at the foot of steep limestone mountains, which form the southern and eastern boundaries of a rich and extensive plain. Between this village and the gorge on the slope of the hill are the remains of an ancient town. Huge blocks of marble in several places mark the line of ancient walls towards the plain, and on the summit of a hill behind are the remains of a fortified citadel, surrounded with a high sloping bank, capped with a wall of very rude construction, and of loose stones. The ruin, however, which throws everything else into the shade, and which I think can be nothing else than the temple of Jupiter mentioned by Strabo, is the perfect ground-plan of a magnificent and gigantic temple. When I say the ground-plan, I mean that the lower course of stones, all of immense size, and from three to six feet high, of the whole building, remain entirely perfect; so that the whole structure of the building, the cella, pronaos, adytum, passages on each side, small apartments, and two separate inclosures, surrounding it at a great distance, can be most perfectly made out. The length of the whole outside, without the inclosures, is 219 feet, the width 140. The dimensions of the cella are 87 by 65. It is altogether the most striking monument of antiquity I have yet seen in Asia Minor. The other interesting object here is the basso-relievo sculptured on the rock, which appears to have been an ancient quarry.

August 25.—I left Yúzkát, proceeding by rather an indirect road to Sumgurlú, twelve hours from Yúzkát, on one of the roads to Angora. I had made frequent inquiries after the mines of rock-salt which are said to abound in this country, but hitherto without success. At Sumgurlú, however, I ascertained that at a small village six hours off, to the north, in the middle of a range of mountains, there were mines of rock salt now worked. I was still more anxious to see them, as I had hitherto found nothing in the geological formation of this country at all resembling the for-

* In vol. vi. Journal R. G. S. Mr. Brant states the distance to be three hours north-west.

† See page 80 of this volume.

mation of the saliferous districts in other countries. Leaving, therefore, my baggage and servants at Sumgurlú, I started off with a guide armed as a Kurd, with a long lance, for a ride of six-and-thirty miles there and back. In about two hours we reached the summit of the ridge of hills, which forms the northern limit of the rich valley of Sumgurlú, and on looking over the hills towards the north-west and north, I at once found myself in a district of red sandstone: marl and sandstone conglomerate, alternating with marl and gravel of a grey and blueish colour; the very counterpart of the saliferous district of England, as far as I recollect. It was still early in the morning, and the eastern sun shone brightly on the red sandstone hills, which contrasted strongly with the country, through which I had been so long travelling, consisting of limestone, and trap and igneous rocks. The red sandstone beds (whether old or new red I cannot pretend to say, having found no fossils in them, although I incline to think them new), when I first came upon them, had a very slight inclination or dip towards the south-east. As I proceeded, however, to the north-west, the inclination gradually increased, until, on reaching the hill where the rock salt was said to exist, I found the beds were completely vertical. After ascending a narrow winding gorge for some distance, between perpendicular walls of red sandstone conglomerate, the highest points of which were in places worn by the action of the weather and by time into lofty and fantastic pinnacles, I reached a small circular plain or basin, in the very centre of the hills, surrounded on all sides by steep barren rocks. In this little basin I found the mines of rock salt, which occur only eight or ten feet below the surface. The stratification of the salt is perfectly horizontal, whilst the rocks which surround it are vertical. This I believe is rather a curious fact, and seems to prove that the deposition of the salt must have been long subsequent to that of the surrounding rocks; subsequent even to the great convulsions, which have carried these beds into their present vertical position; and which afterwards, when travelling to the westward towards Angora, I found was owing to the eruption or elevation of a range of trap or porphyritic hills, consisting of porphyry, greenstone, &c., all of them igneous or volcanic rocks. Here must, at some period or other, have existed a salt lake, in the bottom of which the salt was deposited. Before I conclude my geological digression, I will only observe that though former travellers talk of granite hills, and vast granitic plateaus in this part of Asia Minor, and particularly between Angora and Yúzkát, I have not yet seen a particle of granite in the country, but a great extent of igneous and volcanic rocks; trap, trachytic, porphyry and a great deal of porphyritic and trachytic conglomerate.

From Sumgurlú I had intended visiting Changeri, the ancient Gangra, and from thence by Kal'ah-jik* to Angora—but hearing that the plague was raging at Gangra, I gave it up, and proceeded direct to Kal'ah-jik, which is situated about two miles to the north of the Halys, here flowing through steep and picturesque rocky hills; it appears a more considerable river than where I crossed it last, near Vezír Kópri.† The bridge at Kal'ah-jik was a most primitive and slender construction, consisting of a single row of planks, laid across three long beams, the planks loose and separate, in many places worn through; the holes, when they become large enough for a horse's leg to go through, being generally stopped up with a stone, but not always. It is about eight feet wide—no parapet, and about thirty feet above the river. The town of Kal'ah-jik is built round a steep and high Acropolis, and is quite a situation to have been chosen by the ancients. I found a few inscriptions in the Armenian burial-gound; but none of great importance. Instead of proceeding direct to Angora from Kal'ah-jik I went round by a small village, three hours off the road to the north, where I was told I should find some inscriptions; and where I did find two, both sepulchral, but one was interesting, as mentioning a people of Galatia, or a town mentioned by Pliny, but otherwise unknown. At first I thought it might have been Sama, but Sama is too far off, and I am rather inclined to give it to Come, the town probably of the Comenses, mentioned by Pliny as a people of Galatia; the site of which may have been at the village called Akjah-tásh,‡ where are many other remains of antiquity: columns—a bas-relief representing a soldier bearing a standard—several tombs, and large blocks of hewn stone. Behind the village rises a rocky hill, which may have formed the Acropolis, and I thought I could trace lines of walls and ruined buildings. From thence to Angora is a ride of twelve hours, the same distance as from Kal'ah-jik to Angora. On our way the Súríjí § (postilion) lost his road, and having got entangled among the mountains, which separate the district of the Halys from the source of the Sangarius, we suddenly found ourselves in the midst of a large encampment of Kurds. Such a rencontre, two years ago, would have terminated in our being completely plundered; now, however, thanks to Rejíd Páshá, who had subdued the bulk of the Kurdish tribes in their own country, the Kurds in Asia Minor are tolerably quiet, and respect all agents of the Porte. But their proud and independent manners contrast strongly with those of the other subjects of the Porte; and if the day should ever come, when Asia Minor is to be under a civilized government, these wandering hordes will

* Vezir's Bridge. † Little Castle.
‡ Whitish stone. § Or Súrújí, i. e. driver.

be the greatest difficulty to contend with. About eighteen miles from hence I passed through the extensive plain of Chibúk* and over the scene of the great battle between Bajazet† and Tamerlane,‡ but no one here knows anything of the more minute distributions of the localities of that great event.

At length, nearly two months after leaving Trebizond, I reached Angora on the 2nd of September. This city is situated on one of two steep rocky hills, which rise up in the middle of a plain, and between which a small stream flows to the westward, being one of the sources or feeders of the Sangarius. These hills are of a dark brown porphyritic rock, and are connected by a low ridge of hills towards the east with another range of hills of similar formation. The citadel, which is on the summit of the southern rock, is defended by a double wall on the west and south sides, composed almost entirely of fragments of marble, inscriptions, bas-reliefs, statues, pedestals, columns, architraves, and such like fragments of former splendour and magnificence, which form a striking contrast with the mud houses of the present inhabitants.

September 13.—Left Angora for Sevrí-hisár, and reached that night the village of Balúhuyumí, a small place at the foot of the high trachytic plateau, which rises up from underneath the chalky limestone, the chief formation in this part of Asia Minor. The next morning I visited a curious old fort on the summit of a high hill, a few miles south from the village. It consists of a nearly circular wall of very large and small blocks of stones, rudely put together, and about ten feet high. Inside, the whole space is divided into a number of small chambers, a perfect labyrinth. I am inclined to think it an old fortress of the Gallo-Græci. Returning to the village, I started by Bergjaez, another small village, the country chiefly barren and uncultivated, not a tree to be seen, and the streams all dry. The next day over the same character of country, low barren undulating hills intersected by dry valleys: in some of them here and there a little corn is grown.

September 15.—About fifteen hours or fifty miles from Angora, I reached the banks of the Sangarius, a deep and large river, flowing through a wide and flat plain, its course being from south-south-west to north-north-east. I could not here learn anything satisfactory about its source, but from what I afterwards heard, it seems to be very ill laid down in our maps. Halted this day at the village of Múlk, near which I saw some curious caverns, probably sepulchral, divided into many irregular chambers.

September 16.—This morning I found at Múlk a long Latin inscription relating to the repairs of the roads of Galatia and Cap-

* Pipe. † Bá-Yazíd (from Abú-Yazíd). ‡ Tímúr Leng.

padocia, Pontus, Pisidia, &c. by the Roman Governor. Before reaching Sevrí-ḥiṣár* I made an excursion of about five miles off the road, to visit some ruins at a place called Aslán-kóï,† where I found the remains of a ruined town—probably not ancient. It lies to the eastward of the chain of hills placed east of Sevrí-ḥiṣár and a few miles south of Pococke's route, in Colonel Leake's map. This chain of hills consists of mica-schist and crystalline limestone, but appears not to be continued to the south of Yermah:‡ at its southern end between Yermah and Bálá-ḥiṣár § it rises to a considerable height and forms Mount Dindymene: on its western slope are the marble quarries. It may be called a mountain peninsula, stretching south-east from the high mountains to the north into the great flat central plain of Asia Minor, which, geologically speaking, rests against it.

From Sevrí-ḥiṣár I visited the ruins of Bálá-ḥiṣár, which are very extensive, and which, from an inscription removed from thence to Sevrí-ḥiṣár, and on various other grounds, I have no doubt mark the site of Pessinus.

September 19.—Left Sevrí-ḥiṣár for Afiyúm-Kará-ḥiṣár‖—my first day's journey to Alckiám—where the ruins of the ancient town of Orcistus are to be seen on a rising ground, a few miles to the south of the Sangarius, or a main branch of it; for two principal branches unite about four miles to the north-east of the village, the one coming from the south-east, the other from the west. From Alckiám I proceeded fifteen miles south by east, over a flat undulating barren country, to a Turkomán encampment, called Hamzah Ḥájí;¶ thence ten miles south by west, where I found the remains of a very large town in a dreadful state of dilapidation. Part of the wall of the Acropolis exists on a flat table-land to the north of the ruins, which are known by the name of Khergán-ḳal'ah, which Colonel Leake doubtfully marks Arabúsa? but they should be to the east, not to the west of Alckiám. I know not whether they have been before visited. When we recollect that Pessinus is at Bálá-ḥiṣár, it is clear that these ruins must be those of Abrostola—the distance will perfectly coincide. Here I found no inscriptions nor any remains of particular interest.

September 21.—Hamzah Ḥájí to Beyát**—six hours and a half; the first half of the road nearly due west along the end of the plain, and in a valley along the bed of a small stream, now dry, I passed several villages. In all the burial-grounds, and at every fountain, are fragments of architecture and inscriptions. At three hours and a half reached the village of Gumúk-ḳóï††—a

* Cypress Castle. † Lion Village, properly Arslán ḳóï.
‡ Written Germah. § Bálá-ḥiṣár, i. e. Upper Castle.
‖ Or Ofyúm Kará-ḥiṣár, i. e. Opium Black Castle. ¶ Pilgrim Hamzah.
** Written Beyád. †† Bone-village.

short distance to the south-west the Phrygian mountains begin: they may be called a continuation of Emir Tágh, and they extend north-west to Murád-Tágh, south of Kútáhyah: about one mile south-west of the village I found, a little to the right of the road, the ruins of a town upon the low slope of the hills: it is near the entrance of a broad valley, which leads up to Beyát, from eight to ten miles distant. Its situation corresponds with that of Arabusa: at Beyát I found nothing remarkable. Leaving Beyát, I crossed a range of steep and rugged mountains well wooded, and descending on the west side in a south-westerly direction, observed some very remarkable sepulchral chambers excavated in the white rock. I reached Eskí-kará-hisár* that day, situated at the head of a small plain, and about two miles north north-west from the celebrated quarry of Docimitic marble, which I thoroughly examined.

September 23.—Four hours to Afiyúm-kará-hisár—a good road, crossing a rich and extensive plain, where much opium is grown. The appearance of this large and straggling town is very striking. It lies at the foot of a high craggy range of hills, extending nearly from east to west, while in the middle of the town a dark and lofty mass of black volcanic rock (trachytic) rises perpendicularly to the height of about 300 or 400 feet; its summit covered with the ruins of a Byzantine, or more probably Turkish fort. In front of the town three or four similar conical trachytic hills rise up as a kind of natural fortification. No inscriptions to throw any light on the ancient name of this place.

September 25.—Set out for Antioch in Pisidia—in a south-easterly direction along the plain, having on our right a high range of mountains—on our left an extensive plain stretching far away to the eastward.

In the modern town of Yalobách, near the ruins of Antioch, I found many inscriptions, but almost all Latin; one of them has the name of Antioch. The aqueduct extends a great distance from the high chain of hills which I had crossed the day before, and which separates Yalobách from Ak-shehr,† distant six hours. From Yalobách my course was west-south-west, until I reached the beautiful lake of Egerdir. The scenery about it, particularly at its southern end, is quite Italian. Surrounded on all sides by lofty mountains, wooded in places to the water's edge, the lake is sometimes confined by their steep rocky sides, which rise almost perpendicularly from the water. In others, rich and luxuriant vineyards and orchards cover the sloping plains which extend between the mountains and the lake. The town of Egerdir is picturesquely situated on the south-west side, at the foot of the high cliffs; and its castle is built on a narrow neck

* Old Black Castle. † White Town.

of land running out to the north-east; it is the work of the Sultán Aladdin, one of the Sultáns of Iconium. Beyond the point are two pretty islands covered with trees, with neat red roofs peeping out: they are chiefly inhabited by Greeks. In the town all are Turks. Before reaching Egerdir we had to pass round the southern end of the lake, in which direction a narrow richly cultivated plain, about two miles wide, extends as far as the horizon, bounded on each side by high wooded mountains. No hills appear to the south. A large, deep, and clear blue stream flows out of the lake at this end, and I was told that four hours off, the river falls into another very large lake, thirty-five or forty miles in circumference, which has no visible outlet; and that from thence the water flowed under ground till it nearly reaches Atáliyah.* From Egerdir I went to Sparta or Isbártah, and thence I visited Sagalassus, near the modern village of Aglásún. I was much struck with the singular appearance of these ruins, and particularly with the theatre, which is the most beautiful and perfect I have seen. It is not quite so large, but I think it superior to that of Hierapolis. The distance from Sparta to Sagalassus is not great, perhaps seven or eight miles: but a lofty ridge of steep rugged mountains runs east and west between them, and makes the road, up one narrow valley and down another, extremely difficult.

From Isbártah to Baldúr. I travelled some way along the plain in which the lake of Baldúr is situated, but at a considerable distance from the lake. I was surprised to find that it produced no salt. The water is brackish, and a little sulphureous. • • •

From Kechíbúrlú I crossed a low range of hills to the west, on my way to Dineïr. This is undoubtedly Apamea Cibotus, notwithstanding what is said to the contrary. The fact is, that nobody has yet discovered the real lake Aulocrene, which I was fortunate enough to light upon, not a mile distant from Dineir, amongst the hills to the west. Before reaching Dineïr I came to a beautifully clear and rushing stream, flowing down from the hills on my right, which I immediately concluded must be the Mæander; and following up the narrow, rocky, and wooded ravine through which it flows from the north-east, the ravine at about a quarter of a mile expanded into a small winding plain, at the upper end of which I came upon a small lake covered with high rushes and full of fish and water-fowl. Not a stream flows into the lake, which may be a mile or a mile and a half in circumference. But a very considerable stream flows out of it; which, after rushing along the narrow ravine above mentioned, on entering the plain, changes its course to north-west, and flowing near the foot of Mount Celænæ, which is between the lake and the plain, flows through the park

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* Pronounced Adália, whence the modern Greek name 'Αδάλια (Adália).—F. S.

of Cyrus to Dineïr, at which place it is joined by another rapid stream flowing from the north, which, before entering the town of Dineïr, had, like the former, flowed down a steep and rocky ravine, rushing along with considerable noise. This could be no other than the Marsyas. I followed up this ravine from Dineïr about a mile, and then found it rose suddenly from amongst huge masses of rock, at the foot of a high, steep, rocky hill, the Acropolis of Celænæ. There is nothing volcanic in the rocks here. They are all limestone, chiefly of the scaglia or alpine limestone formation, in one bed of which I found, what I have rarely seen in Asia Minor, a great number of fossils, chiefly nummulites and terebratulæ. The extensive plain to the south-west and south of Dineïr, between four and five miles across, is the park of Cyrus, which perhaps extended some way to the east up a fine rich valley.

October 8.—I left Dineïr for Khónás, passing by the salt lake of Chárdák, probably the ancient Anava. Arundel calls it Hadji Ghieul,* a name not known in the neighbourhood. It is strongly impregnated with salt, which is collected in great quantities. I visited some ruins about three miles from Khónás, which proved to be indubitably those of Colossæ;† for I found the remains of a theatre, very imperfect it is true, but enough to prove it could not belong to the Byzantine town of Khónás. Remains of sepulchres, and tombs cut in the flat surface of the rock, in great number. In the midst of these ruins, three streams join in a deep narrow gorge. The main stream flowing down the plain from the east is the Lycus; that from the south, flowing from the gardens of Khónás, and from Cadmus, or a portion of that range, rises up in a great body at once from the foot of the hills, a few miles to the west of Khónás, and is, I believe, what Arundel took for the Lycus; but I am convinced it is the original spring and source of the river, and not a re-emergement; the character of the country forbids it: the other stream, which comes from the north-east, is a very remarkable one, and possesses such extraordinary petrifying qualities, that the whole plain, on that side of the river, is completely formed by its deposit, which extends some way to the west. The stream now flows over a cliff of its own formation, rather higher up than where it appears to have flowed in former times; and the gradual dripping of the water over this cliff is regularly advancing the cliff to the edge of the torrent, which in many places it quite overhangs; and if allowed to flow in the same direction, will in time form a natural bridge over the Lycus. Immediately below the ruins, these combined streams flow through a very narrow gorge of great depth, formed by two cliffs of the same mate-

* Hájí gól, i. e. Lake Pilgrim.

† As is also proved by the express testimony of Nicetas, the Byzantine historian, surnamed *Chomates*, from his being a native of the place.—F. S.

rial; for I afterwards discovered another spring of the same interesting qualities, flowing down from the hills to the south-west, and meeting the Lycus near the site of Colossæ, but rather below it. It is almost apparent on inspection that these two streams have at some distant period formed, by their overhanging cliffs, a natural arch over the river, which has extended some way down, but has been disrupted by an earthquake. There are several mills near the junction of these rivers, which are turned by the petrifying stream; and as a proof of the rapid accumulation of this calcareous deposit, it may be observed that it is frequently necessary to change their position, from their becoming completely choked up, and buried in the calcareous silt deposited round the buildings by the spray and overflowing of the mill stream. It is a most curious and interesting sight, and here I have no doubt was the spot where Herodotus says the Lycus disappeared in the very town of Colossæ.

From Khónás to Denizlí, three hours. I have visited Hierapolis, and Laodicæa and Tripolis, and have materials for making a tolerable map of this part of the country. At Laodicæa there is a very interesting and magnificent building attached to the Stadium. From thence I reached the Mæander at Géizel-hisár,* and visited the ruins of Antiochia and those of Mastanea: the latter are insignificant, but the name is preserved in that of a village close by, and there is enough to prove the existence of an ancient town. At Aïdín† I was delayed a day to procure horses. I had intended crossing the mountains towards Tireh and Baindder, but from the plague being at the former place, I went round by Aiásolúk‡ (Ephesus), but reserving for another opportunity the examination of its remains.

I arrived at Smyrna on the 21st of October.

V.—*On Mount Athos and its Monasteries; with Notes on the route from Constantinople to Saloniki, in June,* 1836. Communicated by Lieutenant Webber Smith, 48th Regt. Read January 9, 1837.

The classic land of Greece has formed the subject of so many descriptions and researches, and more especially during the present century, by our own countrymen, Clarke in 1801, Colonel Leake in 1805 and 1806, and Dr. Holland in 1812, that little would seem left to be gleaned by future travellers, more particularly since the recent publication of Colonel Leake's valu-

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* Beautiful Castle. † Brilliant.

‡ From Ἅγιος Θεολόγος, the peculiar title of St. John the Evangelist.—F. S.

able travels in northern Greece; still it seems that greater attention has been paid to its classical and antiquarian topics than to the physical geography of the country, especially in the more eastern parts, as Macedonia and Thrace, still subject to Moslem rule; and as, during the past summer, I travelled from Stámbúl* to Saloniki, ascended Mount Athos, and visited its monasteries, and have, since my return, through the liberality of the hydrographer to the Admiralty, been permitted to correct my own hasty observations by the valuable survey of those coasts just completed, I trust I may venture to offer my notes as a slight contribution towards the improvement of our knowledge of the geography of this beautiful, but misgoverned country.

May 17, 1836.—I left Constantinople by the great Belgrade road, passing successively through the towns of Kuchúk, and Buyúk, Chekmehjí, or little and great bridge, each built over a small inlet of the Sea of Marmora, along the northern coast of which the road winds in a westerly direction as far as the walled town of Selivrí Selymbria, close to the sea, at about thirty-five miles' distance from the capital. The road thence ascends a hill which projects into the sea, and continues along the coast, through vineyards and gardens for seven miles, where the Belgrade road turns off to the north-west. This latter I followed for eighteen miles, over an undulating country dotted with tumuli, passing through three villages before I reached the town of Chórlú,† containing about 800 houses, chiefly inhabited by Turks. Here I quitted the Belgrade road, and travelled across the country, which is very little cultivated, to the south-west, crossed the river of Chórlú, and in six hours reached the town and port of Rodostó,‡ the Tekír Dágh§ of the Turks, situated at the south-eastern foot of Mount Rhodope, at the head of a bay.

The town contains about 2000 houses,‖ almost entirely occupied by Greeks. The Roman Catholic priest told me his flock consisted of only thirty persons. Rodostó had formerly much trade, which has dwindled almost to nothing, as it now exports only a few dried fish to the capital. The rising importance of Einos¶ may have partly caused this, but it is chiefly owing to war and misgovernment.

On the 17th of May, a few days before my arrival here, a woodcutter had been frozen to death: snow had fallen to the depth of two feet, and remained on the ground for two days; an extraordi-

* The Greeks seldom call Constantinople by this its Græco-Turkish name.—F. S.

† Or Chórlí. This particle may be written either lú or lí.

‡ Anciently Rhœdestum.

§ Tekkúr tágh, Emperor's mountain.

‖ Dr. Clarke says 10,000 in 1801.—Ed.

¶ Also called Í'nós by the Turks. Its ancient name Ænos is still preserved by the Greeks, who pronounce it Eïnos or Eïno.—F. S.

nary and unusual occurrence, when we consider that the town is situated on the sea-shore, in the parallel of 41° north, with no *very* high mountains in the immediate vicinity. The range of Tekír Dágh, extending from the river Maritza* to the sea, may be said here to reach its south-eastern termination, but I saw no snow on any of its points.

Quitting Rodostó, the road leaves the shore of the Sea of Marmora, which trends to the south-west, and continues through an undulating fertile country, but without any traces of cultivation, as far as Yeníjeh, whence a route turns off south-west to Gallipoli. At thirty miles from Rodostó we reach Malg'harah, which may contain 500 houses, and thence by a bad, hilly, and stony road, five hours bring you to Keshán, apparently a thriving town of 900 houses, seated at the eastern edge of the valley or plain of the river Maritza or Hebrus, on the slope of a hill forming the south-western termination of the range of Tekír Dágh. Keshán seems to have a good deal of trade, probably from its advantageous position at the junction of the great roads leading to Eïnos, Gallipoli, Saloniki, and Stámbúl.

On the banks of the Apsinthus, two hours from Keshán, and near where the river is crossed by the road to Gallipoli, are some ruins, where two years since some valuable coins and vases were found. On inquiring what had become of them, I found they had been seized by the Agáh and sent to Constantinople. There are likewise some ruins and foundations, at one hour's distance from this, to the north, on the road towards Ipsala, but they are in a very dilapidated state, and not worth visiting.

The inhabitants of this part of Thrace are almost entirely Greek, and spoke of their Turkish masters 'in fear and trembling.'

From Keshán I turned off to the west-south-west, and took the direct road to Eïnos, crossing two branches of a stream flowing to the south-south-east, the road chiefly over a plain, occasionally breaking into small hills. In a distance of twelve hours I counted five miserable villages.

At nine hours from Keshán, about three miles to the right of the road, is a large monastery, perched on the ridge of part of the Chatál-Tepéh,† which rises 1305 feet above the sea, and round which the road winds till we reach the projecting peninsula, at the extremity of which is situated the town of Eïnos.

May 21.—Eïnos, placed at the south-eastern corner of a shallow bay, about three miles in its greatest diameter, not fifteen miles, as is represented in the large French map by Lapie, and incautiously copied into many others, is a town of 1500 houses, about 150 of which are occupied by Turks, and they by no means

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* Maricheh in Turkish. † Fork-hill.

the most respectable part of the community; the rest by Greeks, with the exception of 50 inhabited by gipsies, who are scattered in greater or less numbers all over this part of Turkey. Here is an old castle, possibly of Genoese construction. In its walls are several slabs with figures on horseback carved on them, but much defaced, and in the wall surrounding the principal church is a beautiful Greek inscription referring to the building of the church when the city was in the hands of Francis Palæologus.

Eïnos, being not three miles from the entrance of the river Maritza, or Hebrus, which is, at times, navigable for boats as far as Adrianople, and offering a secure harbour for vessels not requiring more than six feet water, has the appearance of a thriving port, with some little trade. A quarantine is established here on vessels coming from Egypt.

Immediately to the eastward of Eïnos, Mount Chatál-Tepéh rises 1300 feet above the sea, and a hilly country extends for thirty-five miles to the eastward, forming the northern shore of the gulf of Xérós.* To the north of Eïnos, looking over the marshy ground near the mouth of the river Maritza, at a distance of nine miles, a range of hills, probably part of the chain of Rhodope, again commences, varying from 800 to 900 feet high, and extending along shore for thirty miles to the westward, as far as Marogna, where it reaches 2174 feet above the sea, and then terminates almost abruptly on the west.

As the plague was raging along the road between Eïnos and Saloniki, I hired an open sailing boat for 250 piastres to take me to Mount Athos. The patron or master of the boat had commanded a band of men in former times in Samothraki, where he gloried in having defeated the Turks.

May 24.—I landed on the north-western end of the beautiful island of Samothraki, which rises abruptly to the height of 5248 feet above the sea, abounding in rocks, and trees and streamlets, and spent some time examining the ruins of Palæopolis, which offer nothing very remarkable. We then sailed to the west point, landed, and rode three miles to the village of about 300 houses, all Greek, with a Turkish Agáh. During the revolution the Turks burnt their church, which they are rebuilding. The people appear a hardy set of mountaineers, but in abject poverty. The situation of the ancient Acropolis is extremely picturesque, and well selected for defence. It will be remembered that St. Paul touched at this island on his way from Asia Minor to Philippi.

May 25.—Landed at Thaso, another beautiful island, larger than Samothraki, but not so lofty, the summit of Mount Ipsarió, the highest in the island, only reaching 3428 feet above the sea.

* Sárós of the Turks.

Here rock is piled upon rock, the whole thickly wooded with pines. In former days this island was celebrated for its quarries of white marble, rivalling that of Paros in beauty.

The northern point of the island is only distant three miles and a quarter, as ascertained by the late survey, from the plain of the Kará Sú,* or Nestus, on the southern shore of Thrace. Twenty miles further north Mount Xanthè reaches upwards of 3800 feet above the sea, while to the north-west the far more conspicuous Piláv-Tepéh† rises magnificently to a height of 6143 feet, almost rivalling the Athona in beauty.

May 27.—Landed at Cape Sphigménu, on the eastern side of Mount Athos, after a voyage of five days in accomplishing a distance, in a direct line, of less than eighty geographical miles.

On the south-eastern shore of the district of Saloniki, forming part of the ancient province of Macedonia, three remarkable peninsulas, of about twenty-five miles in length, by nearly four in breadth, project in a south-easterly direction, and almost parallel to each other, into the Archipelago, embracing the gulfs of Monte Santo and Kassandra, or the Singitic and Toronaic gulfs of the ancients.

The most eastern of these three peninsulas, better known by the name of Mount Athos, the Acte of former days, the A'gion‡ Oros of modern Greeks, and Monte Santo of the Franks, is joined to the main land of Chalcidice by a low sandy isthmus of undulating ground, while its south-eastern extremity rises abruptly to the height of 6349 feet above the sea.

The general aspect of the peninsula is rugged, being intersected by innumerable ravines. The ground rises almost immediately and rather abruptly from the isthmus at the northern end to about 300 feet, and for the first twelve miles maintains a table-land elevation of about 600 feet, for the most part beautifully wooded. At this spot the peninsula, between the monasteries of Vatopédi on the east, and Kastamonítu on the west, is narrowed in to rather less than two miles in breadth. It immediately afterwards expands to its average breadth of four miles, which it retains to its southern extremity. From this point also the land becomes mountainous rather than hilly, two of the heights reaching respectively 1700 and 1200 feet above the sea. Four miles further south on the eastern slope of the mountain ridge, and at a nearly equal distance from the east and west shores, is situated the town of Karyés,§ picturesquely placed amidst vineyards and gardens. A good road leads hence down a steep valley to Iviron|| on the east. A fine richly-wooded valley also leads in a north-easterly direc-

* Black Water.
† Pilau-Hill.
‡ Pronounced nearly as Ayon Oro.
§ Karyés, i. e. Walnuts.
|| Ibérón, i. e. the Convent of the Iberians.

tion towards Pandokrátora and Vatopédi; and the road to Xiropotamu is good, but hilly, and the country it traverses is the most fertile and beautiful part of the peninsula, richly wooded with oak, chesnut, &c.

Immediately to the southward of Karyés the ground rises to 2200 feet, whence a rugged broken country, covered with a forest of dark-leaved foliage, extends to the foot of the mountain, which rears itself in solitary magnificence, an insulated cone of white limestone, rising abruptly to the height of 6350 feet above the sea. Close to the cliffs at the southern extremity, we learn from Captain Copeland's late survey, no bottom was found with sixty fathoms of line.

May 28.—Sphigménu,* a monastery within battlemented walls, forming a square, at the outlet of a narrow valley close to the sea, with good gardens and vineyards. The Igumenos told me here were forty-seven Caloyers, all Greeks; the convent very poor, and had been obliged to sell their books.

Kiliantari, half an hour, by a beautiful road, through brushwood in flower, now and then a venerable plane tree and a bubbling stream. The monastery, a huge triangular building, in a picturesque valley opening to the sea. Half a mile off-shore is a small rock. The monks here are chiefly Bulgarians.

May 29.—Vatopédi, a vast fortified monastery, seated on a height near the shore, at the south-eastern angle of a small bay, whence a rich valley leads in a winding direction between ridges, whose summits rise 1200 and 1700 feet above the sea, as far as the town of Karyés. The path from Kiliantari is over undulating ground, affording beautiful glimpses of the dark blue sea. It is rough and stony, and takes rather less than three hours. From the bottom of the bay projects a small tongue of land, on which are the ruins of an old tower. I examined it with care, but could find nothing to guide me as to its date. Two small brigs were at anchor in the bay, but they could only remain in fine weather or with the wind off-shore.

May 30.—Pandokrátora is a poor place; nothing to recommend it but situation, on a cliff overlooking the sea. The road from Vatopédi is shaded for the whole distance by magnificent trees. At about half way on the left is a tower on the projecting headland. Stavronikita is a miserable place in a beautiful situation, half an hour's ride by a wretched road, through box, laurel, brambles, roses, &c. overrun by wild honeysuckle. Passed two towers dignified with the name of arsenal, where the monks keep their boat-gear and fishing-tackle.

May 31.—Iviron, a vast quadrangle, one of the largest monas-

* Or Sidenu, *i. e.* the Convent of the Saint in Bonds.

teries on the Mount. Its library appears in much better order and larger than elsewhere, but they had no catalogue; and the librarian fiercely refused, when I asked if they would sell any of the MSS.

Karyés, one hour. The road winding up the right side of the valley, at whose outlet Iviron is placed, crosses a picturesque bridge over a mountain torrent, and continues up the valley to a monastery called Kutlumusi, situated in a fertile country, a small establishment of twenty-five Caloyers only, all Greeks. The town or village of Karyés is at the head of the valley I had ascended, looking down towards the sea, almost encircled by an amphitheatre of hills, covered with a rich mass of foliage. It is the residence of the Turkish Aghá, a kind gentlemanly man, who was very civil; and he with his brother are the only two Turks on the peninsula.

Here is held a weekly fair or market on Saturday, which presents the singular spectacle of a fair without noise, and a crowd without a woman. I should rather say without anything *tame* of the feminine gender. Horses, bulls, rams, and cocks are not uncommon; but everything of the other sex is absolutely forbidden, as far as man can forbid; but uncivilized nature asserts her rights, and wild pigeons and other birds, and insects, especially bees, abound, and in spite of the monks' unnatural regulations, afford a valuable source of profit.

To this fair the neighbouring country people bring corn, and wine, and iron work. The Caloyers supply crosses prettily carved in wood or horn, beads, prints of their favourite Panagia or of their monasteries, and some few shops are opened for caviar, salted fish, ammunition, &c. This lasts till the sun has risen three or four hours. when the shops are shut, the monks depart, and Karyés again assumes its wonted tranquillity.

Karyés may contain a population of 200, all Greeks, exclusive of the monks.

June 1.—Returned to Iviron, and thence by Mylopotámo, formerly, I am told, a monastery, now only an arsenal, as they call it, belonging to Lavra, to Philotéu, by a rugged path, which would be really dangerous, were it not for the trees which stand on the sides of the precipices. Within half an hour of Philotéu the path crosses a torrent, and immediately on the right is a small pool, formed by the water falling from a rugged height of sixty feet, the whole shaded by oak and pine, and brilliant with dragon flies and butterflies, rejoicing in the moisture exhaled from the pool.

Karakalo, a moderately-sized monastery, half a mile from the sea, near the head of a steep valley, and commanding a beautiful view of Samothraki, Thaso, and Lemnos. The monks tell me they had a library, but during the Greek revolution they had 300

Turks quartered here, who, when they left the place, took everything with them.

Lavra, a long ride of three hours and a half, over a rugged, but well-wooded country, gradually assuming a more mountainous character, leads to the south-eastern extreme of the peninsula, known to sailors by the name of Cavo Żmyrna, or more commonly to Franks as Capo di Monte Santo, on which stands the magnificent monastery of Laura or Lavra, above which the peak of Athos rises abruptly. Here are two churches and twenty chapels, with room for some hundred Caloyers. It is considered as the most important and richest monastery on the Mount. The churches are larger and cleaner than any I have yet seen; the floor inlaid with marble, and the refectory, in the form of a cross, has its four-and-twenty tables of marble. The library, too, seems good, but they said they had no catalogue.

June 2.—Fine clear morning: started for the ascent of Mount Athos, the monks kindly furnishing mules and a guide. Immediately on leaving Lavra, the path winds round the southern slope of the mountain, at about 600 feet above the sea. Below, perched on the cliffs, are the skiti or askiti* of Kerasia and Kapso-kalývia. By a rugged, but well-wooded path, through a forest of oak, chesnut, pine, ilex, arbutus, &c., we wound round to the north-west side of the mountain, where the scenery at once assumes a different character, and the ascent commences over almost precipitous rocks. Immediately over our heads a broad belt of foliage, above which is seen the bare conical peak of Athos, without a tree or a shrub to break its well-defined outline. At two hours and a half the path enters one of the gorges of the mountain, covered with pines, many of which had been felled, and lay across the road. Twice I had to throw myself from my mule to avoid being swept off by their branches. At three hours and a half we arrived at a chapel dedicated to the Panagia,† and some cells, above the wooded region, and at the foot of the barren cone of white limestone which forms the summit of the mountain.

The road hence is no longer practicable for mules, and my Albanian guide refused to accompany me any further. He said it would take an hour and a half to reach the summit. I scrambled up for some distance, but found it very fatiguing, and not safe alone, and unfortunately the day was hazy, as is almost always the case during summer in Greece, and thus I should not have been able to see distant objects. Still, on looking to the eastward,

* Askités (ascètæ) very small cells, usually built near each other, with a catholicó or common chapel near at hand. Γεωγραφία Νεωτερική. Vienne, 1791, p. 257.

† Pronounced nearly as Panayea, the stress being on the penultima; when on any other syllable, it is always marked in this paper.—F. S.

the island of Thasos, distant thirty miles, Lemnos, distant forty, and Samothraki, distant sixty miles, appeared almost at my feet.

Turning to the westward, I overlooked the projecting peninsulas of Longos* and Kassandra, which, compared to the peninsula of Athos, may be considered as low; and from the late survey it appears that the highest point of the former does not exceed 2596 feet, and of the latter not above 1078 feet above the sea.

I looked in vain for the shores of Thessaly, and the range of Olympus, which, towering to the height of 9754 feet, would on a clear day be distinctly visible, although at the distance of ninety miles; but the usual haze that prevails in this country during the summer months prevented my seeing it. A few heavy drops of rain fell, and the pealing of distant thunder gave me hopes of seeing a storm raging at my feet; but it passed away, and I was disappointed. Descended to the monastery at Lavra.

I do not find any account recorded of English travellers having ascended to the summit of Athos since Dr. Sibthorp and Mr. Hawkins on the 12th of August, 1787,† now nearly half a century ago, whose brief but excellent account of the ascent is comprised in a few lines. From it we learn that the lower bed of the mountain is composed of gneiss and argillaceous slate, and the upper part grey limestone, more or less inclined to white: the latter part I can confirm by my own observations. It is highly probable that many other travellers have ascended the mountain since that time, but they have not, that I am aware, given any account of it. During the late survey of these shores in October, 1831, Captain Copeland, R. N., had his theodolite, &c., conveyed to the summit, as I am informed by an officer who was employed on the survey, and from that elevated station took the angles between Pelion, Ossa, Olympus, Pierus, &c., with the bearings of all the mountain peaks, islands, headlands, capes, &c., within a radius of at least ninety miles; a glorious and beautiful panorama, such as few positions on the face of this habitable globe can offer.

June 3.—Embarked in a spunge-boat from the Morea, at the Arsaná at the foot of the monastery of Lavra, where is a curious tower, and coasted round the southern promontory, which, seen from the sea, is highly picturesque and beautiful. I remarked a singular appearance at the base of the rock, where, two feet above the present level of the sea, a groove has been formed for some hundred yards distance, apparently by the beating of the waters. A similar groove is also formed, or forming, at the present water's

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* Lunguz and Kasánderah of the Turks. (Hájí Khalífah's Rúm-ílí und Bósnah. Wien 1812, s. 82.—F. S.) Τὸ Λογγὸ (Γεωγρ. Νεωτ. p. 255). Therefore Longum rather than Longus; but Meletius (lib. xviii. c. 23, tom. ii., p. 462) has Λογγός. —F. S.

† See Walpole's 'Continuation of Memoirs,' &c., p. 40.

edge, and this a double groove is visible, which I remarked in several places. The fishermen tell me the tide is scarcely perceptible here. Can the Mount have been upheaved? or may the waters have subsided? Perhaps some geologist will examine the subject.

The Skiti or Askiti* of St. Anne occupies a beautiful niche in the rocks on the south-western cape, exactly corresponding to Lavra on the south-eastern point, being immediately at the foot of the peak of Athos. Between this and Lavra I remarked two small villages, most romantically situated, and apparently inaccessible; but it seems that they are inhabited by independent Caloyers. I believe they are called Kerasia and Kapso-Kalývia.

St. Paul comes next in order on the south-western shore, inhabited by Bulgarians. This monastery is undergoing a thorough repair, and they are building a high wall to protect it. It might have done so in the time of its founder, but is useless now.

This side of the peninsula is far more rugged and precipitous than the north-eastern side. Between the last-named monastery and St. Dionysius a very remarkable slope of loose shingle descends to the water's edge at an angle of 45°, and extending from 600 to 1000 feet above the sea. It is the more singular as the features above and on each side of it appear as when first formed; ravines and precipices in the same huge block. It is immediately below the smaller cone which projects from the north-western side of the peak.

June 4.—St. Dionysius, half an hour by water. The position of this monastery surpasses all I have seen. It is perched on a lofty rock, almost overhanging the sea, and at the mouth of a striking ravine.

The monks here refused me mules to go to Simópetra, distant about three miles, and some way inland, as they said the road was not practicable.

St. Gregory on a cliff at the entrance of a deep ravine. The monks, I observe, are careful to shut out the air from the mountain, and to let in the sea-breeze.

Xiropotámu is one of the largest of the monasteries, with high walls and flanking towers, at a quarter of an hour's walk from the shore, up a steep hill, commanding an extensive and beautiful view. I here sketched a very graceful and perfect female figure, seated, and with good drapery, in white marble, on the inner wall of the monastery.

June 5.—I went to Karyés, through a country even more beautiful than any I have yet seen: too good for its unprofitable

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* Σκήτη (ἀσκήτη) for ἀσκητήριον, "a place devoted to (holy) exercises," seems to be a very barbarous corruption of language: perhaps it arose from ἀσκητῇ, the feminine of ἀσκητίος.—F. S.

occupants. Oak, chesnut, arbutus, &c. occasionally small plains covered with grass, more like a magnificent and well-wooded park than a wild district.

June 6.—Rússiko; two hours' riding over a stony road. On our way passed the ruins of the former monastery, occupied entirely by Russians. The present one was built in 1814 by Callimachi,* a Greek of Constantinople, said to have been afterwards murdered by the Turks. It is large and well built, and capable of containing from 2000 to 3000 persons. The church is yet unfinished: no library worth mentioning.

Xenófu, one hour's ride; a moderate-sized monastery, inhabited by Bulgarians chiefly, seated at the entrance of a valley close to the sea. A short distance up the vale are the ruins of an aqueduct, and beyond a Skiti or village.

Dokhiaríu, a small monastery containing thirty Caloyers: nothing worth notice. Near this spot is the cave of a noted recluse, who has lived here in a cell for fifty years, apart from all mankind; yet his feelings would seem not to be blunted, as he bestows the care and attention on a favourite rose-tree which, if well directed towards the good of his fellow-creatures, might have made him a useful member of the community.

Kastamonítu. Two roads lead to this wretched little monastery, which is in a retired spot at some distance inland. The one near the sea, which is the best, is said to take two hours. The monastery contains only fifteen Caloyers, and is excessively dirty.

Zográfu. This rich Bulgarian monastery is beautifully situated in the midst of fine woods of oak, chesnut, elm, and the Judas-tree. Nature is always bounteous in this fertile spot. The monastery contains thirty Servians and Bulgarians.

This completes the monasteries on the south-western shore of the peninsula, all of which I have visited; but I have not entered into a full description of them, as it has already been done by scholars far more equal to the task than myself; yet I thought it might be useful to record their state in the present day, were it only for the sake of comparing it with the accounts of former travellers, as Pococke in 1740, Dr. Hunt and Professor Carlyle in 1801, and Colonel Leake in 1806; and especially as during the Greek revolution the Christian tenants of the Holy Mountain had to fly before the stronger arm of Moslem soldiers, and of course the monasteries must have suffered much. I subjoin a list of the numbers in the twenty monasteries, distinguishing the Servo-Bulgarians, as given me by the Superior of each, and writ-

* Probably one of the Phanariote family, several of whom were Dragomans of the Porte, and afterwards Hospodárs of Vallachia or Moldavia.—F. S.

ten down at the moment; yet I must notice that there seemed a disposition to reduce the number of those sent out to beg—

	No. in Monastery.	In Cells.	Mendicants.
Kiliandari { Servians and Bulgarians }	120	10	40
Sphigménu . .	47	—	—
Vatopédi . .	120	—	50
Pandokrátora . .	15	—	15
Stavronikita . .	15	5	5
Ivíron . .	100	—	60
Philotéo . .	20	8	5
Kutlumúsi . .	25	25	20
Karakálo . .	60	26	—
Lavra . .	60	40	20
Pavlo (Servo Bulgarian)	36	20	15
Dionysio . .	80	6	—
Gregorio . .	18	—	1
Simópetra . .	15	5	10
Xiropotámu . .	40	65	20
Russiko (Russian) . .	45	4	—
Xenofu (Servo-Bulgarian)	30	30	—
Dokiaríu . .	30	—	—
Kastamonítu . .	15	—	—
Zografú (Servo-Bulgarian)	30	—	20
	925	244	281

In all 1450 men. In this are not included the novices, who may amount to 150 in all.

There are here also from 10 to 12 Skitia or villages inhabited entirely by Caloyers, the chief of which is St. Anne, on the south-west point. These may average perhaps 40 men each; making from 400 to 500 men, and from 200 to 300 scattered kellia or cells, which, with the town of Karyés, reckoned at 200 persons, would make the whole population of the peninsula about 2500 persons. This would seem to be a great falling off from the number of 6000 stated by Dr. Clarke in 1801; but, as I before mentioned, it depends upon doubtful data. I only give it as an approximation in the absence of anything better.

Of the revenue of the monasteries I could obtain no account, but I fancy they have much decreased of late. The Wallachians, Bulgarians, and Servians have been the chief benefactors of the monasteries.

Their libraries seem to be in a much worse state than when visited by Professor Carlyle in 1801, when he examined about 13,000 MSS.*

The sites of the five ancient towns which formerly existed on Actè I leave to more able scholars to determine.

June 7.—Left Zografu for Saloniki: road tolerably good; the first part of it through a forest of oak, chesnut, elm, &c. I observed several old towers. At the extremity of the high land of the peninsula we descend about 300 feet to the isthmus, and continue along its northern shore over undulating ground, till we reach the site of the canal cut by order of Xerxes, but which has been so much filled up, from some cause or other, that I honestly confess I could see no traces of it; but I did not leave the road to seek them.

Of its existence there cannot be a doubt; and I am told the officers on the late survey traced it without much difficulty. Four miles beyond it I reached Erissós, situated on a hill close to the bay of the same name, and consisting of thirty houses inhabited by Greeks. After a fortnight on Mount Athos, how beautiful do the rustic forms and sun-burnt faces of the peasant girls appear! The road to Saloniki continues along the shore for some miles, till near the high land of the northern projecting cape, when it turns nearly west, and enters a hilly country at Nizvoro, where we left the silver and lead mines on our right, and continued through a well-wooded country to Laregovi. Eight hours hence by a mountainous road brought us to Galatz, a small town on the northern side of a beautiful and broad valley, richly cultivated and watered by a stream flowing to the westward.

June 9.—Continued along this valley to the westward as far as the pretty village of Vasilikó, of about 120 houses with gardens and vineyards; thence westward as far as Sedes, when, leaving on our right a range of mountains, some peaks of which rise to 3900 feet above the sea, and on our left the gulf, we passed over the great plain which extends to the walls of the city, and entered the gate of Saloniki.

Annexed are some of the Heights determined trigonometrically during the late Survey of these shores by Captain Copeland, R.N.:—

* See his Letter to the Bishop of Durham in Walpole's Memoirs, vol. i., p. 196.

Province.	Name of Mountain.	Height in Feet.	Lat. North.	Long. East.
			° ′	° ′
Thessaly.	Olympus	9,754	40·5	22·21½
	Ossa	6,407	39·48	22·42½
	Pierus	6,161	40·15½	22·14½
	Pelion.	5,310	39·27	23·3
	Peak 4 m. S.E. of Dhimitri	5,119	40·8	22·19
	Peak 4 m. W. of Platamona . . .	4,874	39·58	22·32
	Mavro voúni . . .	3,564	39·37	22·47
Saloniki.	Khortiatzi	3,894	40·34	23·8
	Kholomon	3,420	40·29	23·13½
	Peak 5 m. E. by N. of Saloniki . . .	2,675	40·38	23·5
	Volevod (?) 9 m. N.N.W. of Saloniki	2,173	40·47	22·54
	Peak 5 m. N.E. of A. Paulo	2,092	40·21½	23·11½
Kassandra.	Summit	1,078	39·58½	23·34
Longos.	Summit	2,596	40·6½	23·50½
—	Karvouna	1,842	40·9	23·49
Athos.	Peak	6,349	40·10	24·20½
—	Above Simópetra .	3,249	40·11¼	24·17½
—	Karyés	2,195	40·14	24·16
Gallipoli.	Pilav Tepeh (Pirnari)	6,143	40·53½	24·6
	Xanthe	3,815	41·9½	24·47
	Maronia	2,174	40·53	25·32
	Chatal Tepeh. . .	1,305	40·43	26·11
Thaso.	Ipsario	3,428	40·42	24·43
—	Elias	3,374	40·43	24·40
Samothraki	Feugari	5,248	40·27	25·37
Imbro.	Elias	1,959	40·8	25·50

VI.—*Observations on the position of Tavium.* By W. J. Hamilton, Esq., F.G.S. Communicated by W. R. Hamilton, Esq., F.R.S. Read January 9, 1837.

The situation of Tavium, the principal town of the Trocmi or Eastern Galatians, has been considered a point of great importance by those who have taken an interest in the geography of Asia Minor, and who, in ignorance of any ancient ruins in the part of the country where the ancient Itineraries tend to place Tavium,

have conjecturally assigned three different modern places as its site, viz., Chorúm, Yuzkát, and Tekiyeh. It is probable, however, that none of these places represent the ancient capital of the Trocmi, but a village named Boghazkói, situated between Chorúm and Yuzkát, about twenty-five miles distant from the former, and within twenty miles of the latter. Here M. Texier, two years ago, discovered extensive remains of antiquity, though, for reasons which I cannot understand, he has attributed them not to Tavium, but to Themiscyra. Neither Chorúm nor Yuzkát have the appearance of having been ancient sites. The former town, which has not been described by any modern traveller,* is situated in the middle of an extensive elongated plain, surrounded by barren hills at the distance of about two miles from the town to the east and west. Its length is much more considerable. A small stream runs through it from north to south, which afterwards flows to the eastward, and ultimately falls into the Chotílek Irmák, a large river which joins the Iris or Tokát-Sú, about eight miles above Amasia. It lies consequently on the eastern side of the range of hills which forms the watershed between the Halys and the Iris; and as natural boundaries generally formed the limits of ancient countries, this district was in all probability not included within the province of Galatia. According to the Turks, Chorúm is, comparatively speaking, a modern town, founded by Sultan Amurath, by whom a large handsome mosque and a square ugly fortress were built. In the walls of this castle are inserted many Greek inscriptions and shafts of columns, but the former are all sepulchral and apparently of Christian times. They are said to have come from a village called Húrhát, about thirty miles west by south from Amasia, and where there are some few remains of the substructions of a church. This is probable, for there is another inscription in the court-yard of the Governor of Chorúm, of the same character, which my Tatar, then in the service of this Governor, seized in the possession of some Armenians who were taking it to Marsivan, and which had been found at the same place. The distance of Chorúm from Amasia is only about 48 miles, whereas the Peutinger Table gives 73 Roman miles between Amasia and Tavium.

Yuzkát is situated in a narrow valley, confined on the north and south by high barren hills, and offers no natural advantages for the situation of a town. Wood and fuel are extremely scarce, and it commands no rich or fertile plain, and possesses no sufficiently insulated height to answer the purpose of an Acropolis. As a town also its date is very recent, having been founded by Achmet

* See Leake's Asia Minor, *in fine*.

Pashá, the father of the famous Suleiman Bey, of the Chapán Oghlú family, about eighty years ago.* Not a fountain or corner of a house can boast a block of stone which has the least trace or appearance of antiquity. It is said indeed to have been a miserable mountain yaila or summer residence of the peasants, before Chapán Oghlú fixed upon it as his residence.

Rennell, on the authority of Tournefort, supposed Tekiyeh to represent Tavium. Tournefort merely mentions that he halted at a place called Tekiyeh, between Tokát and Angora; but this probably (Tekiyeh being a common Turkish name, meaning a saint's tomb) is not the same place as the village Tekiyeh, which is situated between Amasia and Chorúm, six miles east by north of the latter, where are some fragments of antiquity, and where I copied two inscriptions; for in this case Tournefort must also have passed through Chorúm, which does not appear to have been the case. This Tekiyeh, moreover, is too near to Amasia, being not more than 13 hours or 42 miles distant from it. But there is another Tekiyeh in the Hasán Ová, an extensive plain, half way between Chorúm and Yuzkát, producing much corn, and in the middle of which is situated the large village of Alajah. This place is between eight and nine hours nearly due south from Chorúm; and in the plain, about two miles south-west from Alajah, there is a large ruined *Tekiyeh*, or sepulchre, and near it a beautiful spring of water, very cold and copious. Alajah being on or near the great road from Tokát to Angora, this probably is the Tekiyeh where Tournefort halted. The caravans even now seldom halt in the villages, but in the neighbourhood, near some fountain, or where pasture is found for their cattle. Here is nothing to indicate the existence of an ancient town. The building is of early Saracenic times, with a handsome marble doorway on one side, very richly ornamented with early Gothic carvings. Besides a few small apartments attached to it, it consists only of the nave or centre, with four large niches or recesses, one on each side, arched over, and the centre appears to have been covered with a dome. In the outside wall I found one imperfect Christian Greek inscription, much mutilated, and in the burial-ground of Alajah several tombstones, evidently Christian, having large crosses carved upon them; but without any inscription.

The ruins at Bógházkói have an air of remote antiquity, and impress the beholder with a great idea of the power and wealth

* Suleiman Bey is well known for his successful resistance to the orders of the Porte, and for his great wealth and power. He was one of the most influential Dereh Beys in Asia Minor before the Porte deprived them of their feudal rights and privileges and independent jurisdictions.

of their founders. They are situated on a sloping hill at the foot of high wooded mountains, overlooking and commanding a rich and extensive plain, which stretches far to the north and north-west, and through which flow several streams. One of these, on the banks of which are the ruins in question, is capable, even at the dry season when I visited it, and when most of the watercourses were absolutely dry, of turning several mills. Immediately to the south-east of the ruins, and between them and the high hills, are several lofty insulated summits, well calculated for forming an Acropolis, and some of which have in fact been fortified.

The distances from Bogházkói to the known ancient sites of Amasia, Angora, and Kaisariyyeh, are, as correctly as I could learn from the Turks, as follows:—

1.	Bogházkói to Angora by Sumgurlú	32 hours,	or 104	miles.
2.	,, ,, Kaisariyyeh by Yuzkát,	36 ,,	,, 117	,,
3.	,, ,, Zilah by Yuzkát	30 ,,	,, 97½	,,
4.	,, ,, Amasia by Alajah	27 ,,	,, 88	,,

The above reduction to miles supposes the Turkish hour to be equal to 3¼ statute miles, which is perhaps rather over than under the truth in this part of Asia Minor, which is in many parts mountainous and rocky. Three miles to the hour would give respectively 96, 108, 90, and 81 miles.

Let us now proceed to examine these roads separately.

1. *Tavium to Angora.*—The Antonine Itinerary gives 116 miles on this road. The distance being deficient on the last station of the road given by the Peutinger Table, we cannot tell what distance was there given to this road. The Turkish computation gives 32 hours, which, calculated at 3¼ miles per hour, gives 104 miles, and at 3 miles per hour, 96 miles. An intermediate number in statute miles will be nearly equal to 116 Roman M. P. So far, therefore, the situation of Bogházkói will agree with that of Tavium.

2. *Tavium to Cæsarea.*—On this road the Antonine Itinerary gives 109 miles, the Table, 191. But this number being evidently incorrect, the route in the Table is useless, unless we suppose Aquas Aruenas to be the same place as Therma, in which case we shall have 113 miles by this route in the Table. Now, the Turks reckon 30 hours from Yuzkát to Kaisariyyeh: we may reckon, therefore, about 34 from Bogházkói to that place, which, reduced to miles, at 3¼ miles per hour, gives 110½ miles, and at 3 miles per hour, 102 miles; numbers sufficiently near to the M.P. deducible from the Itineraries.

3. *Tavium to Amasia.*—Here we certainly do not find the same g eement between the distance from Amasia to Bogházkói,

and the 73 Roman miles between Amasia and Tavium, as contained in the Peutinger Table, the only authority on this route; whereas the distance from Bogházkói to Amasia is about 27 hours or 88 miles passing by Alajah. But there is probably some error in the Table here; for if we move Tavium to a position which is nearer than Bogházkói to Amasia, the distances in the Itinerary, which are generally more correct than in the Table, will no longer agree with those from Bogházkói to Angora and Kaisariyyeh respectively.

The ruins at Bogházkói have already been described by M. Texier in some letters partly published in the French papers. Though few, they are striking and interesting. The principal ruin, and which throws every thing else into the shade, not excepting even the bas-relief cut on the rocks, consists of the perfect remains of the ground-plan of a temple of large proportions. With the exception of one corner, the whole internal structure and arrangement of the cella, pronaos, adytum, passages and small apartments on two sides may be distinctly traced. The whole is formed of huge blocks of marble, with the exception of one end of the building, either the pronaos or adytum, as architects shall determine. The whole length of the building, not including two distinct enclosures which surround it, is 219 feet by 140. The walls are of solid blocks five feet thick, the interior of the cella measures 87 feet by 65.

The temple stands upon a rising ground facing the north-east, on which side the ground appears to have been artificially raised to form a level space. Both to the north-east and north-west flights of steps appear to have led up to the building, and a portico appears to have existed on the north-west side. That Tavium possessed a celebrated temple of Jupiter we may infer from its being mentioned by Strabo, (lib. xii.) who speaks of an asylum, and of a colossal statue of the Deity, and who would in all probability not have alluded to it, had it not been a remarkable building. The large blocks of stone which, although fitting close, are sometimes irregular in their shape, have been fastened together by large metal pins. Most of the blocks have six and sometimes more sockets an inch and a half in diameter, and from the mode in which the stones are broken away, it seems probable that the temple was destroyed by barbarians for the sake of extracting the metal.

I did not discover the slightest trace of shafts or bases, or capitals of columns, or architectural sculpture, or ornaments of any kind. A rude simplicity seems to have pervaded all parts of the building. The space between the cella and the outer wall on the south-east side is divided into a number of small chambers, the

outer wall of each being formed of a single stone varying from 15 to 17 feet in length. These apartments were probably covered over, and on them the columns may have been placed, if any such existed. On the hill-side to the south-west behind the temple I saw many large blocks of stone, but they appeared to me rather to have been derived from the ruins of the temple and its two inclosures, than to have belonged to other buildings.

To the westward of the temple, and on the same sloping ground, are the remains of a square enclosure, probably a fortress. It is surrounded by a raised mound, on the summit of which I traced in several places remains of a massive and almost Cyclopean wall. To the east of the temple are the remains of another fortress on the summit of a high steep hill commanding the town. The summit of this hill is surrounded with a thick wall, or rather heap of loose stones sloping both inside and outside at an angle of 40°, except on the north-east side, where there is a perpendicular cliff down to a deep ravine. At the top I found several large holes excavated in the solid rock, apparently for cisterns, and the whole surface was covered with fragments of ancient pottery and tiles.

The bas-relief cut in the rocks is situated about a mile or a mile and a half north-east from the temple. It is in a small irregular-shaped hollow resembling an ancient quarry. It is open to the south-west, the rocks being from 30 to 50 feet high on each side, but lower at the end opposite the opening. It is a curious and interesting monument, and although many of the figures are nearly obliterated, particularly those furthest removed from the centre, it is undoubtedly the most remarkable monument hitherto discovered in this part of Asia. It represents the meeting of two kings, each holding emblems of royalty in his hand, and with a long train of followers, who extend along the two sides of the hollow space. The two principal figures are five feet high, the few figures near them are three feet six inches, and the others two feet six inches high. One of the principal figures, that on the left coming from the west, as well as his followers, are in light close-fitting dresses, wearing high conical caps and beards. The other principal figure and followers are dressed in loose flowing robes with a square turreted head-dress. These have no beards. The former may possibly represent the king of Lydia or of Egypt, and the latter the king of Persia or of Media; and may not this monument have been intended to commemorate a peace concluded between them? Both these kings were at war with the king of Persia or of the Medes in this part of Asia; and the Halys, which flows about 15 or 20 miles to the north-west, was at one time the boundary of the possessions of the Lydians and the Medes. I am inclined to

consider that the figures without beards and in loose flowing dresses represent the Medes or Persians, rather than Amazons, from the circumstance of some of the attendants immediately behind the principal figure being represented standing upon the wings of a double-headed eagle, a symbol frequently met with on the ruined Persian buildings of a later period which occur in Armenia and other parts of Asia Minor; and the king himself is represented standing on a wild beast, probably intended for a lion, and which resembles some of those animals also sculptured upon Persian buildings.

I regret much not having had time to construct a map from all the bearings which I took, I therefore send the accompanying rough sketch compiled from the general bearings and direction of my route, corrected by astronomical observations for the latitude.

Smyrna, Nov. 10, 1836.

Itinerary.

Iter a Tavium Cæsaream usque M. P. 109 Sic.

Therma	18
Soanda	18
Sacæna	32
Ochras	16
Cæsarea	24

Iter ab Ancyra Tavium. M. P. 116 Sic.

Bolelasgus	24	Ancyra Acitonviaco	36
Sannalius	24	Eccobrigo	33
Ecobrogis	20	Lassora	25
Adapera	24	Stabiu	17
Tavio	24	Tavio	—

Peutinger.

I. Tavium by masia, to Neo-Cæsarea.		II. Tavium by Zela to Neo-Cæsarea.	
Tonea	13	Rogmon	36
Garsi (Gersioura)	30	Ogone	36
Amasia	30	Ptemais	38
Palace	15	Zela	26
Coloe	12	Stabulum	32
Tidis	10	Selanusa	22
Mirones	16	Neo-Cæsarea	15
Neo-Cæsarea	10		
	116 M. P.		195 M. P.

III. Tavium to Comana Pontica.	
Tomba	16
Eugoni	22
* * *	*
Ad Stabulum	—
Mesyla	22
Comana Pontica	15
	—

IV. Tavium to Mazaca Cæsarea.	
Euagina	16
Seralio	24
Zama	22
Aquas Aruenas	35
Dona	20
Sermusa	20
Siva	16
Cambe	22
Maz. Cæsarea	16
	191 M. P.

VII.—*Memoir on the Northern Frontier of Greece.* By Lieutenant-Colonel Baker. Communicated by John Backhouse, Esq. Read April 24, 1837.

The map of the Northern Frontier of Greece was the result of an operation conducted by commissioners of the three Allied Powers, Great Britain, France, and Russia, for the purpose of determining and laying down upon the ground itself the several points of the line with that accuracy which a permanent separation of Greece from Turkey appeared to require, and the necessity of which arose from the incorrectness of the best existing maps, and the imperfect geodesical information supplied by modern travellers to guide a work of this nature and importance.

Previously to entering upon a connected description of the tract of country over which the line of boundary is carried, it may be as well to glance at the extent of those data which were essentially necessary to enable the line to be fixed, and for the geographical delineation of the ground which it traverses.

These data were wholly wanting. It was indeed owing to the absence of them that the commission originated; since, had it been possible to trace the frontier on any existing map that could be depended upon, it might have been unnecessary to appoint officers to mark it out who were total strangers to the country, and who were only enabled to feel their way through it by a previous reconnoissance of the ground itself.

The general direction of the line being nearly east and west, and, consequently, at right angles to the usual routes of communication leading from Thessaly and Epirus, on the one hand, to Locris, Bœotia, Acarnania, and Ætolia, on the other; the points of *intersection*, merely, are those touched upon in the itineraries of Gell, Dodwell, and Holland, whilst the intervening districts, of a wild and mountainous character, not very easy of access, or inviting from the Klephtic and disorganized habits of the population, had remained unnoticed by any modern traveller.

Colonel Lapie's map, though in itself a very remarkable production, when we consider the many doubtful and heterogeneous sources from which it was compiled, and at that time the best extant, was still very defective on all the most important points of the line.

Its most accurate data are derived from the itineraries above referred to, and though the routes given by Sir William Gell were very serviceable to us in the investigation of the eastern extremity, and especially in his description of the pass of Khlomo, yet in the examination of Western Greece and the more central districts of Agrafa, the only authority open to a reference lay in the voluminous, though somewhat inaccurate, work of M. Pouqueville, "Voyage de la Grèce," on which, in common with the information supplied by Sir William Gell and Mr. Dodwell, Lapie's map was framed; but we soon found it necessary to shut it up, it being impossible to place any confidence in its details.

From the Gulf of Arta to the Valley of the Sperchius, Lapie's map does not bear the least resemblance to the real configuration of the ground. It is incorrect in the position assigned, and the denomination given to the several mountains, and even to some of the principal villages.

Thus the name of Macrinoros is given to the whole chain of mountains dividing the basins of the Gulf of Arta and of the Aspro, instead of being marked, as it is, a secondary, and very subordinate feature. Tymphrestus, the modern Veluchi, is placed in the range of Agrafa, instead of the position assigned to Callidrome, near Karpenitza;—no part of the chain of Othrys is known by the name of Varibovo or Hellevo; the course of the Aspro is very incorrectly marked, and the two bridges of Korakos and Tartarina are confounded in one.

If the able and comprehensive work on Northern Greece from the pen of Colonel Leake had, at that time, made its appearance, it would have assisted in clearing up many doubtful points in the investigation of unexplored ground, upon which every local information, we were obliged, on the spur of the moment, to resort to, had frequently an obvious and direct motive for misleading rather than assisting us.

In the determination of the line, therefore, the course pursued by the commission was to examine, beforehand, the features of the country in the direction assigned by its instructions, and wherever any discretionary power, originating in doubtful points, was left open for its determination to select those most conformable to the objects required, with a further reference to those positions of the line which, in immediate connexion, had already preceded, or were to follow them; and then to decide upon their adoption before it proceeded to the investigation of any new district.

In the subsequent operations for the completion of the two maps which were directed to be presented respectively to the governments of Greece and Turkey, it was thought essential that a work of this importance should be based upon a trigonometrical survey of, at least, a narrow strip of country on each side of the frontier line; and with this view a base of 4100 French metres* was measured with great accuracy in the plain of Arta in the summer of 1833, with the intention of carrying a continuous series of triangles from the Gulf of Arta to that of Volo.

Political difficulties and the disturbed state of the country contributed to prevent the completion of this work in the mode and on the scale which had been originally intended. In the mean time, the French survey of the Morea having been directed to be extended to Northern Greece, or at least to Attica, Bœotia, Locris, Doris, and a part of Ætolia,† it was determined, as this operation advanced, to base the triangulation on an extension of their stations to the extreme frontier for the eastern and central districts, combining and meeting it by a series of triangles in connexion with the base in the plain of Arta for the map of the western portion as far as the chain of Agrafa; the coast line at the two extremities being compared with and corrected from the accurate survey of the Gulfs of Volo and Arta under Captain Copeland and Mr. Cooling.

Although the boundary, therefore, was examined and politically determined in its whole extent during the autumn of 1832, yet the various difficulties ‡ adverted to above interposed to prevent the completion of the surveys and of the map till the spring of 1835.

Including its sinuosities, the whole extent of the line, from the Gulf of Arta to that of Volo, is nearly 137 miles, and was defined by 95 land-marks § placed in such positions as any change in its direction caused by diversity of feature, or any doubt of the apparent conformation of the ground appeared to require.

At its commencement from the western extremity it intersects the low sandy promontory of *La Punta* (the reputed site of the

* 4483·83 English yards.

† The disturbed state of Western Greece and the disorganized habits of the population have deterred the brigade topographique employed on this survey from any attempt at its extension to Acarnania and the mountainous tracts of Agrafa.

‡ The opposition of the Turkish authorities debarring us from all access to the Ottoman territory, and confining the operations to the southward of the line, not only produced great embarrassment in the selection of the stations, but induced the adoption of the scale of $\frac{1}{150000}$ instead of $\frac{1}{50000}$, which had been originally intended.

§ These landmarks, in the inhabited districts at the two extremities, were mostly destroyed by the Turks in the winter of 1832: they were restored again in the ensuing summer, and the Greek commissioner attached to the commission being personally acquainted with the sites of each of them, their more solid and permanent restoration was confided to the care of his government.

ancient Actium) by a line drawn through the midst of a marsh at a medium distance of about three miles from the fort of the same name, which, on the Acarnanian shore, commands the entrance of the Gulf of Arta, at that spot not more than 600 yards in width, between the town of Prevesa on the left, and La Punta on the right.

From the eastern shore of La Punta the line traverses the Gulf of Arta in a north-east direction, passing between the promontories of Skafidaki and Panagia, and disposing of the islands in the Gulf according to their relative proximity to the northern or southern coast line; those of Guidaronisi and Karakonisi being left to Turkey, whilst Kefalo and the group called Vouvalu were allotted to Greece. None of them are inhabited, with the exception of Karakonisi, on which is a small convent and chapel dedicated to the Virgin, where two priests reside, and where there is a small vineyard and garden, the rest of the island being covered with large olives and prickly oak. This island, strictly speaking, is connected with the northern shore of the Gulf by two causeways or strips of sand, inclosing extensive lagoons, where the water does not exceed a few inches in depth, the one attaching it to the coast near Salagora, about three miles in length, the other passing through two small islets of the same group, and meeting the shore about two miles and a half to the north-east, near the *Bocca Falsa*, or old mouth of the river Arta. The ancient course of the river to this point may be very distinctly traced; and in confirmation of the change having taken place at no very distant period, the greater part of the land situated on the present right bank is still the property of the village of Komano on the left. The connecting causeway of Karakonisi to the eastward passes about 200 yards to the southward of the very remarkable Hellenic ruin now called Fido-Kastro, and the position of which seems to agree very well with that of the ancient fort of Ambracus. This consists of an irregular pentagonal inclosure of Hellenic walls of the third order, surmounted by masonry of a later date, apparently Roman, rising abruptly from the water, without any intervening strand, to a height varying from 15 to 25 feet, one side of the pentagon being short, and the general figure approaching to an irregular quadrilateral of about 160 yards in length by 140 in breadth. The Hellenic masonry, in regular courses of large blocks, rises in most places to about two-thirds of the height of the inclosing wall, the depth of water both within and without not exceeding a few inches; so that it is only accessible in one of the monoxyla, or canoe-boats hollowed from a single trunk, commonly used in the lagoons for fishing.

Projecting turrets at the northern and southern angles are calculated to afford a partial flank of defence to the adjacent sides. There are also two turrets on the sides of the quadrilateral facing

the north-east and south-west. The entrance to the inclosed basin is the only break in the circuit of the masonry; it is placed in the south-east angle, and, singularly enough, is the only spot not well flanked.*

The island of Kefalo appears to have been occupied at some period as a post for the observance or defence of the entrance of the Gulf, as foundations of walls of the usual Roman construction, in alternate courses of rough masonry and tile, are traceable in the whole extent of its coast-line, as well as those of some ruined buildings in the interior of the island, which however is of very inconsiderable extent, not being more than 250 yards across, and nearly level with the water's edge. Guidaronisi and the group called Vouvalu are barren rocks.†

After traversing the Gulf of Arta, the line of boundary strikes the coast-line at the north-east corner of the Gulf, at about a quarter of a mile to the northward of the ruined metochi of Menidhi, at a point where one of the lower offsets of the Macrinoros range abuts boldly upon the sea-shore; and it is thence carried over the eastern slope of the basin of the Gulf of Arta, in a direction nearly east-north-east for about fourteen miles and a half. Following the western base of the above-named offset, in a northerly direction, for about three-quarters of a mile, to its extremity, the line then turns at right angles to the east, crosses a small valley or gorge forming the entrance of one of the principal passes of the Macrinoros, and is directed towards the base of another offset of the same range descending in a direction parallel to the first. The line then follows the base of this hill for about a

* This description corresponds exactly with the κλειστὸς λιμὴν of Scylax and Dicæarchus in their notice of Ambracus; and as the opening of the basin was evidently on the side of the ancient channel of Aracthus, it was so well protected as to dispense with the necessity of any flank defences.

† The annexed return will show the comparative value of the several fisheries in the Gulf of Arta, as following upon the Greek or Turkish coast-line respectively:—

	Piastres.
Fishery of Mazoma and Gnio Vivari	8,000
—— of Lachi (near Prevesa)	11,500
—— of Gripo (near Mazoma)	3,500
—— of Avlieri and Zeucalia (from Luro to Salaora)	12,500
—— of Logaru (east of Salaora)	25,000
—— of Coftra	250
Total of Turkish fisheries	60,250
—— of Agrilo (near the Macrinoros)	6,000
—— of Catafrico (near Arapi)	600
—— of Riza (near Vonitza)	350
Total of Greek fisheries	6,950

They were let for these sums by auction in 1832.
The Turkish piastre in 1835 was equivalent to about 3*d.* English money.

quarter of a mile, till it arrives at the Doubsa river, at the ford which is crossed by the road leading from Arta and Comboti to the Macrinoros and Karvanserai. It then ascends the Doubsa by its left bank for about one mile and three-quarters, traverses that stream and the offset descending from the Drimonari range of hills, which separates it from the river of Comboti, descending to the latter by a ravine which joins it about half a mile above the village of the same name, occupying an elevated knoll upon the right bank.

From this point the line ascends the course of the river Comboti in an easterly direction for about eight miles and a quarter to the source of its principal tributary in the plateau of Milia, which divides the basin of the Syntecno, of the Comboti and of the Arta rivers; and from this plateau, in a direction nearly east for about one mile and a half, it attains, on a well-defined ridge, the summit of Chelóna.

This mountain, so called from the resemblance which, when viewed from a distance in the environs of Arta, it bears to a tortoise (χελώνη) both in its hump-shaped form and in the variegated spots of heath, pine, and rock, scattered over its western face, is the most prominent and remarkable of the upper chain which encircles the basin of the Gulf of Arta to the eastward, though in altitude scarcely exceeding those of Veletchico or Syntecno, which flank it to the north and south. Veletchico presents a bleak and barren surface to its summit, whilst Syntecno and Sycharitza, still further south, are very remarkable in the distance, both from the boldness and sharpness of their outline, and from the contrast presented by their bleached calcareous formation to the patches of dark pines which in some places mark their rugged and almost perpendicular ascents.

The portion of the line here described may be said to cover all the principal approaches to Western Greece. The passes of the Macrinoros, as well as the ridge of Drimonari, which protects and secures their right flank, afford, in the rear of the river of Comboti, an excellent position for its defence. The ridge of Drimonari being flanked by, and in immediate connexion with, the lofty mountain-chain of Chelona, and this last falling as abruptly to the eastward into the valley of the Aspro, forms an admirable defensive line from the Gulf to the river. The first four or five miles from the coast, following the base of the lower ranges of the Macrinoros, skirt on the one hand a small but fertile plain, extending from the mountains to the marshes and salines of Koprena, on the left bank of the river Comboti, but which were specially consigned to Turkey. The valley of the Comboti, as well as the general face of the country between the Gulf and the river Aspro, is covered with thick wood, increasing in size and varying

in character in the ascent from the sea to Mount Chelona; the lower levels abounding with many varieties of the oak and plane, and occasionally with a dense underwood of arbutus, prickly oak, mastic, and other shrubs, whilst the upper slopes are studded with remarkably fine pines and silver firs. The only Hellenic remains we met with are—1. The Castro of the Macrinoros on the summit of a wooded knoll, about 500 feet above the level of the sea, immediately behind Menidhi. On the apex is a small Pyrgo surmounted with masonry of a more modern date, the ensemble of which is a very striking object from every part of the Gulf; and on the slope of the hill to the northward are two outer inclosures also of Hellenic foundations, forming a kind of advanced work to the first. 2. There are two small Pyrghi further to the southward, on the crest of the Macrinoros near Langadia, also evidently intended for the defence of the pass, and not calculated, either by their extent or situation, to afford accommodation for any amount of population. Another Hellenic inclosure of inconsiderable extent, in the interior of which we found great quantities of broken tile and pottery, occupies an elevated position on the Drimonari ridge, near the point of connexion with the Macrinoros, and was probably intended to combine a surveillance of the right of the passes with that of the valley of the Comboti, leading to the vale of Syntecno.

From the summit of Chelona* to that of Gabrovo, a space of three miles of bare rock, the line is carried along an undulating ridge, forming, on high table-land, the basin of a Katavothron, the most prominent elevations of which are called Platovouni and Rachigreocopoulo. From Mount Gabrovo to the wooded height of Itamo the line traverses the basin of the river Aspro (including its tributaries) in a direction east-north-east for nearly thirty-one miles. It descends the western slope of this basin by the precipitous bed of a mountain torrent called Stus Kapnus, for about three miles and a half to its junction with the Aspro, at about one-third of the distance from the bridge of Korakos to that of Tartarina, the only two permanent communications across the river in this district, when swoln by winter rains, though at other seasons it is everywhere fordable, being reduced to an insignificant stream, almost losing itself amongst the *white* beds of alluvial shingle from which it derives its name.

Both these bridges are remarkable for the boldness of their design and spread of their span of arch; that of Korakos especially (which remains to Turkey as her line of communication between Arta and Radovitch, and Trikala and Larissa) is perhaps unrivalled in the hardihood and lightness of its structure.

* Colonel Leake, in his map of Northern Greece, has given the name of *Furka* to this mountain, but Mount Furka is apprehended to be a part of Agrafa, on the left bank of the river Aspro.

The span of the arch measures 132 feet; the total length of the roadway from rock to rock is 181 feet; whilst the *width*, including a narrow and very low parapet, does not exceed 7 feet 8 inches, and the height above the bed of the river is 125. The road itself is barely 6 feet in width; nor does it appear, by the approaches on either bank, to have been ever intended for wheel communication. The rocks on either side rise perpendicularly to a great height, and nothing can be more striking than the effect of this narrow rib of masonry, connecting the two precipitous banks of the Aspro, at the point where it issues in a romantic glen from the wild gorges of the Tzumerka and Agrafiote mountains, and in a situation where the traveller is least prepared to meet with so beautiful and singular a triumph of the skill of the engineer, resembling more the flying buttress of some light Gothic edifice, than a substantial and permanent communication for man and beast over the foaming torrent of the first river in Greece. Its construction is attributed to the enterprise of the Prior of the monastery of Durikon in Thessaly, and considering its distance from the convent, it does no less credit to the liberality and public spirit of the Caloyers, than to the skill of the engineer.* Bridges of this description, however, are not uncommon in this district: in the valley of the river Petrillo there is one, of which the arch, still perfect, measures 86 feet, whilst its breadth is scarcely 8. There are two others in the valleys of the Platanies and Raftopoulo of similar proportions; but the communications leading to all these, excepting Korakos, have been long since broken up and abandoned, though the arches remain entire. They appear to be all of ancient date.

From the mouth of the Stus Kapnus to that of the Platanies river, the line follows the bed of Aspro for about two-thirds of a mile, passing under a ruined bridge having the remains of three arches, the piers of the central and widest being 60 feet apart. It is known by the name of Stais Trichais, from the practice of restoring a temporary communication during the winter months by means of *hair* ropes. The shore on either side is low and flat, with a narrow strip of cultivated ground on the left bank.

From the mouth of the Platanies the boundary ascends the course of that river in a north-east direction to its source in the mountain of Tzornata, a projecting buttress of the great central chain of Pindus, which it attains in Mount Bugikaki, by a crest of six miles and a half in length, certain peaks of which are known by the names of Aphorismeni, Pende Pyrghi, Tria Sinora, and Stavron to Pastrikon.

The course of the Platanies is the existing boundary between the districts of Leontitos and Megali Vrisi, and the crest from

* It is difficult to conceive from what authority M. Pouqueville drew up his notice of this bridge, which he describes as consisting of *eight* arches.

Tzornata to Tria Sinora between those of Petrillos and Provata; the Tria Sinora, as the name denotes, being the point of junction between the two latter and that of Megali Vrangiana. The ravine by which the Platanies descends from Tzornata is a romantic glen covered with thick wood, the oak and plane gradually giving place, in the approach to the mountain ridge, to varieties of the pine and silver fir. Of these last we measured two, of 18 and 14 feet girth respectively, and there were many others of nearly equal size.

At Papă to Pedema the river appears to have forced its way through a wall of rock, many hundred feet in perpendicular height, the rocks on either side approaching so closely, that a traditionary legend in support of its name, denotes it as having been leapt across by some active priest, whose name, however, has not been preserved to give better authority to the feat.

It can scarcely excite surprise that the events of the last twenty years should have had even a more withering effect upon the population of this portion of Northern Greece than on any other in the immediate neighbourhood of the frontier. Even during the lifetime of Ali Pashá of Jannina, the wild inhabitants of these secluded glens, forming the districts of Upper Agrafa, were only kept in awe by the strong arm and able administration of the despot; but when the reins of authority were loosened by his death, and when the subsequent revolution in Greece not only made these fastnesses the common haunt and refuge of every border bandit, but left it still uncertain to which power they might eventually fall, and therefore made both parties alike indifferent to the tranquillity or organization of so distant and unprofitable a tract, all the ordinary pursuits of social life were relaxed and abandoned, and the habits of the population degenerated into the reckless calling of mere Klephtic hordes.

Many villages have in consequence disappeared; others are reduced to heaps of ruins or simple kalybea, mere groups of huts suited to the nomadic habits of the occupants; and the cultivation of a little barley and maize in the more favoured spots is nearly the amount of their agricultural produce.

Petrillos, a succession of small hamlets in the sequestered glen of the same name, shut in between Mounts Karavi, Bugikaki, and Tzornata, and noted by Colonel Leake as the second town of Agrafa, had at this moment (1832) only two inhabited houses, though the ruins of many others, in every stage of decay, lay scattered for a considerable extent on both sides of the ravine.

The general formation of this part of the Agrafiote range is calcareous, varying very much in character, and with the strata generally very highly inclined. No rocks of a primitive character were observed, though in the more northern ranges of Pindus,

between Metzovo and Calabaka, both serpentine and granite are found in abundance.

The sudden transitions of climate in this district render it extremely unhealthy during the autumn months. It is true that no part of the central range of mountains is above the level of perpetual frost, and before the end of August the highest peaks of Pindus are bare of snow ; but yet the intense heats of summer had scarcely subsided when, so early as the 14th of September, the secondary ranges of hills were capped with snow, and long before the end of October even the lower levels were covered to a considerable depth. This unusual severity indeed was transient, though its ordinary effect is to impede, and frequently altogether to interrupt, the communications during the winter months between Eastern and Western Greece, by the bridges of Korakos and Tartarina, owing to the insufficiency of traffic to keep the road open, so that travellers with loaded mules passing from Arta to Zeitoun or Tricala are forced to take the high road by Jannina, through Thessaly, in order to pass the chain of Pindus by the beaten route to the capital, and even this, being never cleared by manual labour, is frequently, after every fresh fall, impassable for many days together.

From Mount Bugikaki the boundary line descends the great chain of the Agrafiote mountains to the cave of Spilia Kamako, the principal source of the Karitza, which here rushes from the perpendicular face of the rock in a stream of considerable force. This cave is very extensive, the roof in the interior being studded with large stalactites, and a ruined chapel of the Panagia, the probable successor of some heathen Fane of early date, renders it an occasional point of devotional resort to the Thessalian villagers.

From this point the boundary follows the course of the Karitza, in a direction S.E. for about five miles, to its junction with the Mangiar or Mangeri river, which in the lower part of its course takes the name of Megdova, and after receiving the tributaries of Agrafiotico, and the river of Carpenisi, discharges itself into the Aspro below the bridge of Tartarina, nearly opposite the mouth of the Syntecno.

It takes its rise in the eastern base of Mounts Karavi and Affendico, a projecting offset of the first, and after traversing the plain of Nevropolis in a southerly direction, turns to the S.W. and intersects, almost at right angles, the great chain from whence it derives its source.

The connecting feature, forming the hog'sback, as we should term it, of Greece, lies, therefore, in the comparatively low range of hills to the eastward of Neochori, and forming the western slope of the great basin of Thessaly. This feature originating

in the lower eastern slopes of Mount Karavi, after encircling the plains of Nevropolis by a range of moderate height and undulating character, rises, in Itamo and Caprovouni, to sharper crests and peaks of more decided prominence, which it preserves to Mount Vulgari, where it again falls to the low neck and table-formed ridge of Zacharachi Vrisi, from whence it branches to the chains of Othrys and Œta.

From the mouth of the Karitza the boundary line follows the bed of the Mangeri for about 300 yards to that of the Moucha, which it ascends for nearly three miles to the source of its principal and central branch in the Mount Itamo, a very remarkable double-topped peak, thickly covered with pines. From Mount Itamo it follows the crest of the line of hills, of which the principal summits are named Caprovouni and Vulgari, in a S.S.E. direction for a space of thirteen miles and a half, to the neck of Zacharachi Vrisi, the connecting link of the chains of Œta and Othrys with the main chain of Pindus, and, consequently, the point of division between the basins of the Aspro, the Sperchius, and the Salembria; including, of course, their respective tributaries.

The exact site of this spot, so interesting in a geographical, and so important in a political light, since the direction of the central portions of the line resulted wholly from its determination, was ascertained to be about eleven miles N.E. of Veluchi, the ancient Tymphrestus, and about three miles due east of Furna; and, as the table-land of Zacharachi, though not of a very prominent character, or very boldly defined, is an open down, and perfectly clear of wood, no difficulty existed in the exact definition of the several ravines and gullies forming the basins we were desirous of determining. Veluchi had hitherto been supposed to be the connecting point of the three chains of Œta, Othrys, and Pindus, but in fact lies wide of Othrys, and is a part of the chain of Œta, or, more strictly speaking, of the great chain of Greece, and becomes the parent of Guiena, Vardoussia, and Parnassus, the three most lofty mountains of Northern Greece.

From Zacharachi Vrisi to Mount Samendroula the line is carried along the crest of hills generally known by the name of Othrys, in a direction at first nearly S. for about five miles; and then, making a sharp turn at the Tambour of Aios Elias, nearly E. for about fifty-five miles, including the many sinuosities of the ridge, which from Aios Elias to the mountains of Gura (Othrys proper) is very undecided in its general character, and, though an unbroken line of partition between the basins of the Sperchius and the Salembria, is frequently so low and ill-defined, as well as, in many places, so covered with thick coppice wood, and with Katavothra on the very crest, as to make its determination extremely intricate, and to render a proportionate increase in the

number of land-marks indispensable for this portion of the line. From Zacharachi to Samendroula these amount to sixty.

Wherever the boundary happened to approach or to intersect any inhabited district, the most intense anxiety naturally prevailed amongst all classes of the population to profit by the advantages which the new territorial division presented. A very remarkable instance of this occurred in the village of Janitzou, consisting of about sixty well-built houses, many of them of stone, and of two stories in height, with two small chapels, and the inhabitants, of course, like all the rural population, wholly Greek. This village, placed about 200 yards below the ridge of Othrys on the northern slope, having necessarily, from its situation, been consigned to Turkey, the inhabitants, embarrassed by the hardship of their position, which moreover separated them from some of their best land lying on the southern slope of the hill, and finding any alteration of the line in amendment of their position impossible, set themselves to work to remedy the inconvenience by transferring their locale; and, by the following year, notwithstanding the opposition of the Turkish authorities, they had removed the materials of their houses, stone by stone, to an eligible site on the Greek slope of the hill. All traces of *Palea* Janitzou, as the village is already called, will probably, therefore, soon disappear, and a similar feeling will operate in producing, at no very distant period, a very important effect upon the population of those districts which adjoin the frontier.

The subsoil of the whole range of Othrys is a limestone of various and highly-inclined strata, occasionally mixed with iron ore, amyanthe, and asbestos. The presence of iron is in many places so strongly developed, and the facility of land carriage to the Gulf of Zeitoun would be so great, that there can be little doubt of its becoming one day a source of national wealth, whenever the resources or capital of the country can be brought to bear upon the working of the ore.

At the Derveni of Furka the crest is traversed by the high road leading from Zeitoun to Thaumako and Larissa; from this point it assumes, for a few miles, a bolder outline, but beyond Audinitza falls again into a very low and extremely intricate feature, covered with thick wood, till it rises, beyond Petroula, into the knot of mountains known as the Gura Mountains, of which the highest peak, to the westward of Samendroula, is named *Jerocovouni*. These, branching out towards the Gulf of Volo, form Mounts Khlomo and Tragovouni to the eastward, and to the northward, circling round to the westward of Asmeyro, form the link of connexion to Pelion and Ossa, and the eastern slope of the basin of Thessaly.

The direction of the eastern extremity of the line, in its

descent from the chain of Othrys to the shore of the Gulf of Volo, was determined by the position of the pass of Khlomo, which having been specially assigned to Greece, and included in her territory, necessitated the adoption of a boundary to the northward of the ridge on which it lies, between Pteleo and Surbis.

A minute examination of the ground leaving no doubt of the accuracy of Sir William Gell's description of this pass, and of the position which it occupies, the course of the Surbiotico, which runs at the foot of the mountain, was selected from its source in Mount Samendroula to its mouth in the Bay of Surbis, a distance of fourteen miles and a half in a N.N.E. direction. In the upper part of its course this river, which there takes the name of Rossouli, is circumscribed by the lower features of Mount Samendroula into a narrow and densely-wooded ravine, till it emerges into the plain of Surbis by a romantic gorge about three miles from the village of that name, in the cultivation and irrigation of the maize fields and mulberry orchards of which, the original channel is diverted, and in many places almost lost.

The village of *Graditza*, as described by Sir William Gell, in his map and itinerary, as well as in Mr. Dodwell's tour, and copied from thence into Lapie's map, has no existence in the position assigned to it, the large and once flourishing village on that site having been long known by the name of *Gardiki*; but even had it been correctly designated; it would have been impossible to reconcile it with the pass of Khlomo, or to include the latter in the Greek territory by any well-defined line running in the immediate vicinity of the other.

The unchecked marauding parties of the frontier Klephtes have reduced Gardiki, Gura, Surbis, and every village in this district, to a state of the greatest destitution. Half the houses were unoccupied, or in ruins, and the law of the strongest being the only one at that period in force, no security or protection was afforded to the unfortunate inhabitants, of whom scarcely a third remained, compared with the numbers prior to the revolution. Several of these villages, such as Echinos or Ekinos, are now mere kalybea, and their sites may probably soon cease to be occupied.

It will be seen by the preceding notice that the line of demarcation between Turkey and Greece is traced throughout by natural features as well as defined by artificial land-marks; by the base of the lower features of the Macrinoros; by the six streams of the Comboti, the Stous Kapnuus, the Platanies, the Karitza, the Moucha, and the Surbiotico, with the three intervening crests of Chelona, Agrafa, and Othrys. The chain of Chelona is traversed by the two first;—that of Agrafa, by the third and fourth;—and the ascent and descent of the range of Othrys, at its two extremities, is traced by the Moucha and Surbiotico.

It will not be supposed that this boundary forms a line of

separation between the Christian and Mohammedan populations, or that the latter indeed are to be found at all in its vicinity. Personal comfort and personal security naturally draw the Turks together in the larger towns, leaving the rural districts entirely to the care and cultivation of their rayahs. In Patradjick and Zeitoun they were formerly to be met with in considerable numbers; but having sold their property and retired upon Thessaly, so soon as the cession of these districts became known, not a Mussulman is now to be found in either town; and with the exception of the occasional visits of the Dervent-Agás, and the collectors of taxes, no Turkish authority is ever to be met with in the immediate neighbourhood of the frontier. The wild and steril character of the country which it traverses presenting no inducement for the exertions of a population so scanty in amount, the only cultivated ground to be met with is found at the two extremities, in the neighbourhood of Comboti and Surbis, in the valley of the Karitza, and upon the crest of Othrys in the vicinity of Janitzou.

The annexed Heights were obtained during the Survey of the line of Frontier: they are only given as a close approximation to the truth, as the instruments made use of were too small for very accurate observations. The positions are not here given, as they are all marked on the map.

General Position.	Name of Mountain.	Height in feet.
Range of Pindus . . .	Bugikaki . .	7,759
Near Carpenitza . . .	Velluchi . .	7,657
Range of Œta	Katavothron .	7,071
W. of the Aspro . . .	Gabrovo . .	6,479
" "	Chelona . .	6,312
" "	Sycharitza . .	5,908
E. of the Mangeri . .	Itamo . . .	5,789
E. of the Aspro . . .	Carries . . .	5,764
Range of Othrys . . .	Jeracovouni .	5,669
" of Agrafa . . .	Stano . . .	5,538
" of Œta	Goullena . .	4,862
" of Othrys . . .	Andinitza . .	4,392
Opposite Zumero . .	Zurmentzallo .	3,625
Range of Othrys . . .	Janitzou . .	3,431
" "	Xero Vouni .	3,273
" "	Megalo Issoma	3,045
Near Gulf of Volo . .	Khlomo . .	2,950
Negropont	Lithada . .	2,222
S. of port Pteleo . . .	Tragovouni .	2,106
Macrinoros	Langadia . .	1,433
S. of the Gulf of Arta .	Amynderos .	1,421
Near " " .	Kastri . . .	1,365

VIII.—*Notes made on a Journey to the Source of the River Orontes in Syria, in September, 1834.* By W. Burckhardt Barker, Esq.—Communicated by Dr. Lee, LL.D.—*Read Feb.* 15, 1836.

[The following notes were extracted from a journal kept by Mr. W. B. Barker, during a journey through a considerable portion of Syria in 1835. The writer of them, whose father, J. Barker, Esq., many years consul at Aleppo and afterwards at Alexandria, is well known for his obligingness and hospitality to all travellers in the East, has the advantage of speaking and writing Arabic as his native language. His route led him from Beirút to Bátrún and Kanúbín, over Mount Lebanon to Ba'lbek, thence to the source of the Orontes; returning by 'Aïn-neté* to Tripoli, and thence along the coast as far as Suweïdíyah, near the mouth of the Orontes,—a journey of about 400 miles. As the greater part of this route has been already described by Maundrell, Squire, Burckhardt, Irby and Mangles, La Martine, and other travellers, the extracts selected are chiefly those which give a description of the passage of Lebanon and the journey to the sources of the Orontes; no account of the latter, it is believed, having been published: these notes also acquire an additional interest at the present moment, since so large a part of the country to which they relate was desolated by the widely-felt earthquake by which Syria was visited in the beginning of the present year.]

August, 1835.—Left Beirút in the afternoon, with the intention of sleeping the first night at Nahr el Kelb, or Dog's River. The road, after crossing the Nahr el Ṣalíb, lies along the sea-shore to the northward till we come to a craggy promontory, on the northern side of which flows the stream; over the hill is a well-contrived ascent, which I should attribute to Roman, if not to a more ancient construction; on the left, and close to the water's edge, are the remains of what appear to have been baths. On the top of the hill on the right, and overhead in a conspicuous position, are three inscriptions, which have been lately copied in plaster by Signor Bonomi.†

The situation here is very picturesque; two precipitous rocks form a ravine, through which flows the Nahr el Kelb, under a curiously-contrived bridge, which is only made use of during the winter inundations.

Two hours' slow walking brought me to Júní, situated behind a promontory similar to that of Nahr el Kelb, but smaller, in a pretty valley open to the sea, and on a sandy beach where boats bring wheat, barley, and dhurrah,‡ for sale, and pay to Mohammed 'Alí a duty of five piastres per ardeb.§ This place furnishes silk,

* 'Aïn-net-e (نتا), 'the forth-coming spring.'

† See Signor Bonomi's account of these inscriptions, just published in the Transactions of the Royal Society of Literature.

‡ Sorghum vulgare, the Juwár of Hindústán.—F. S.

§ The Ardeb in Caïro is about three bushels of our measure, and one piastre equal to about 3*d.* sterling.—Ed.

which this year has failed, on account perhaps of the disordered state of the people, who were all dispersed in great fear of being pressed into the army, and could not pay sufficient attention to their plantations. I slept this evening in the coffee-house of an Armenian, a fine hearty old man of more than eighty years of age, who had been established here for the last forty years, and had learnt Arabic remarkably well. He still, however, preferred Turkish, and was quite delighted to find that I could converse with him in that language. He doubled his attentions, and spent part of the night recounting his adventures. He had two Armenian Bibles in his possession. He was much grieved at the loss of the best of his sons, a young man of twenty-three, but appeared resigned to the will of Providence.

A little beyond Júní is another promontory that projects into the sea in the same way as the two last-mentioned, and over it the road has been cut. On the left stands an old tower or light-house, which may perhaps be cited in proof of a story told in this country, but for which I cannot vouch,—that the Empress Helena, when the cross had been found, ordered light-houses or beacons to be built from Jerusalem to Constantinople, which on the day of the opening of the tomb of our Saviour she caused to be lighted, and thus conveyed the news to her capital by a sort of telegraph; and they show to this day a similar tower strongly built at Rás Beïrút, at about twenty minutes' walk from the town.

Half way to Jubeïl* is the beautiful little river Nahr Ibráhím, over which is a high bridge A little further on I was overtaken by two Druse † ladies, who were going to see their friends near Jubeïl; their dress, which was rich, and covered with a white veil that concealed the whole person, was kept over their heads by a sort of silver horn. The agility of these women is astonishing: they appear not in the least encumbered by their robes, mounting and descending from their donkeys without any assistance. When riding they put off their slippers for fear of dropping them by the way.

Beyond Jubeïl by the coast there is a spunge fishery, whence a great number of spunges of a fine quality are collected every year by some Greek sailors, who come from Syria, and are generally under French protection.

There is a similar fishery to the south of Beïrút, btween it and Saïdá or Sidon. Bátrún has had a pretty good harbour, but it is now filled up with mud and sand, and only small boats can

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* The Little Mountain, the first vowel is very rapidly and indistinctly uttered, hence Burckhardt spells it Djebail (Syria, p. 179).—F. S.

† Properly Derzé for Durúz, commonly written Druse, is the plural.—F. S.

enter. From Bátrún I left the coast for the interior of the country.

At one hour from Bátrún, after a pretty ride along the valley, we reach the Castle of Maseïlihah, probably Turkish. It stands on a rock, and is about 100 feet high.

On the way to Kanúbín, before one ascends the mountain which leads to Tirzah and thence to Haddad and Bĭdemán (where the Maronite patriarch resides in summer), in the plain, at half an hour's distance from the road, stands the old church of Beïzah; it has four Ionic columns, of which three are standing. The ascent before reaching Tirzah is tedious, but the road pretty good. I slept here under the wall of a Maronite church, and heard the psalmody of the villagers.

The next morning I arrived in two hours at Haddad, after passing a very bad road up a steep ascent.

I was here delighted with the manners of the superior, who, though not an old man, has really a venerable patriarchal appearance; his conduct towards everybody is marked by that humility which governs by the sceptre of love: this he sways with great power and honour, and does credit to the confidence necessarily placed in him. He is absolute master; no prince can reign more effectually over his people. He has private property, which renders him independent of his flock. The patriarch was residing in a country house at Bĭdemán, about two hours from Haddad, and on the top of the mountain. His see is at Kanúbín. The monks here are jealous of their library, and on my asking what books they had, I was answered "none." I obtained, however, permission to see them all, and looked them over one by one; they consist chiefly of books of devotion, many in Latin. They have a printed work in Arabic on Trigonometry, and three books of which I took a note,* but which must be known in Europe. The rest were prayer-books and theological discussions in Syriac and Arabic. There were no Coptic or Cufic manuscripts.

On the road from Bĭdemán to Bisherrí (the village nearest to where the cedars are of the greatest size) is the most delightful scenery imaginable; nothing to equal or surpass it out of Europe. You may easily fancy yourself in a fairy land; every thing seems to grow spontaneously. No peasants are seen at work; they have nothing to do but to sow and reap, and the abundance of water that flows on every side saves them the trouble of irrigating. I never had a pleasanter ride. The poplar, the dark-green walnut-trees, and the weeping willows, form a beautiful contrast

* 1. The discourses of Lokmán the Sage. 2. A Poem by Filibús Fodúl 3. The Tale of King Kál'úd and his Vezír.

with the barren rocks that hang in huge precipices over you, while you pass through a fertile land, refreshed by water-falls in all directions; and the distant view of the cedars on the bare rock, at the foot of a snow-capped mountain, enchants the traveller and raises his expectation of the far-famed forests of Solomon. The quiet appearance of this remote quarter seems to denote the hand of Providence majestically pointing out this place as fit for the retreat of religion in an oppressed land.

Having slept at Bisherrá, I proceeded the next day to visit the cedars. There are many places in the mountain where this tree grows, but in the spot usually shown there are about 600 together.* Before it reaches them, the road takes a turn to the right, and passes along a cliff, the rock of which is so smooth in a slanting direction, that I was tempted to believe it had been artificially formed, in order to slide to Bisherrá the immense blocks of wood used for the building of the Temple, and was more encouraged in this opinion by an examination of the road to Bisherrá, which would not easily allow of such vast pieces passing over it; whereas they might have been launched down this slanting rock to the foot of the hill, and carried thence to Bídemán by way of Hasrún.

I was disappointed by the cedars, although I saw all that I could have expected. From the cedars mounting the adjoining rock, I reached, in an hour and a half, the place where snow is lying all the year round, and descending on the other side, found myself, after six hours' ride, at Deir el Ahmar.† After passing through 'Aïnnete,‡ whither the inhabitants of Bisherra go for wheat and barley, the road to Deir el Ahmar is between hills which gradually decrease in height, and are the natural continuation of Mount Lebanon. At this place begins the plain, at the further end of which, and at the foot of the Anti Libanus, stands Ba'lbek or Baaleth, mentioned in Scripture as having been built by Solomon.§ The old foundations to the north-west of the Temple consist of such stupendous stones from 30 to 67 feet in length, as could not easily be removed, and although much in the way, three of the largest, measuring 63, 64, and 67 feet

* Of course the author must include in this number the young trees as well as the old patriarchs of the forest, as we learn from Bellonius, who visited them in the middle of the sixteenth century, that only 28 of these large trees were standing. Father Dandini, in 1600, counted 20; Thevenot, in 1657, found 22; Maundrell, in 1696, only 16; Pococke, in 1737, counted 15; Burckhardt, in 1810, reckoned 12; Dr. Richardson, in 1818, found them reduced to 7; and M. de La Martine, in 1832, speaks of 7 still remaining, but the snow prevented his reaching them.—Ed.

The whole number amount to about 400, according to Burckhardt (Syria, p. 19). —F. S.

† The Red Convent, erroneously spelt Akhmar by Burckhardt, p. 17.

‡ Spelt Ainate (perhaps 'Aïn atá, *i. e.* gift-spring) by Mr. Barker.

§ 2 Chronicles, chap. viii. 6.

respectively, still form a part of the wall. These, from the appearance of the stone, are evidently of a more ancient date than the rest, and tend to confirm the tradition that ascribes them to the time of Solomon; but these ruins have been too often measured and described for me to add anything further.

From Ba'lbek I started for the source of the Orontes, a place little known, and visited by few, if any, European travellers, from the danger said to attend it. The Metawális, a tribe which is in possession of these parts, are known for their hatred of all sects that differ from them in point of religion; but by passing myself off for an officer of Ibráhím Páshá, I procured a guide with whom I ventured to trust myself in the forest that night, in spite of the notorious character of his tribe.

At an hour's ride from Ba'lbek, before one reaches the first descent and on the left of the road, I saw a perfect sarcophagus and two broken ones, which had all been opened. This place might have been a burying-ground of the ancients, and some excavations would probably throw light on the subject. Through the valley runs a little stream, by the aid of which we made an excellent breakfast on bread, cheese, and cucumbers. Ascending on the other side, I proceeded in an E.N.E. direction along the foot of Anti-Libanus nearly on a plain till twelve o'clock, when I came to a village called Labweh, after having passed an encampment of Turkománs to the right of the road, at a place called Shaad. Labweh is at the foot of the range of Anti-Libanus on the top of a hillock, near which passes a small stream which has its source in the adjoining mountains, and after flowing for several hours through the plain, falls into the basin from which springs the Orontes.

At six hours east of Labweh I reached Fikhí, a village beautifully situated in a small valley, on a parallel nearly with the plain, and at the foot of the said range of the Anti-Libanus.

I here procured another Metawálí guide, and proceeded with him first to Ar-Ras* or "the head," being a village at the extremity of the range. Here a few Christians are suffered to dwell separately from the other inhabitants, that they may do the manual work necessary in the cultivation of such parts of the plain as are within reach of the river of Labweh.

Traversing the plain in a north-east direction for three hours, I regained the river of Labweh, along the banks of which two hours' ride brought me towards evening to the source of the Orontes, called by the people El 'A'sí† or "the rebel," from its occasional violence and windings, during a course of about 200 miles in a

* Abú-l-fedá (Syria, p. 150).

† 'From its *refusing* to water the fields without being compelled by means of watering-wheels,' says Abú-l-fedá (Syria, p. 149).—F. S.

northerly direction, passing through Homs and Hamáh, and finally discharging itself into the sea at Suweïdíah near Antioch. The source here springs with some violence from a natural basin in the rock, of a triangular form, measuring about fifty paces, and nearly concealed on each side by trees and bushes, of which chestnut, willow, and a dwarf oak, are the most common.

The Labweh flows along the base of this triangle in a northeast direction, and mingles its little current with the stream from the spring which here runs at a considerable rate. The three barren perpendicular rocks which enclose this little spot form a striking contrast with the verdure that grows, as it were, upon the water beneath. On the south side of the basin, at the top of the rock, there is an excavation of several rooms, said to have been the hermitage of Márón the first Maronite; two rooms are of easy access, but the others can only be climbed up to with difficulty.

Having made a sketch of this rarely-visited and secluded spot, I quitted it, and took the direction of Bisherrá by another road, which, towards Marzehím, led over the low chain of hills I have already mentioned, as a natural continuation of Libanus; these hills were covered with brushwood, and with bellút, a species of oak,* almond-trees, buckthorn, wild thyme in abundance, and other aromatic herbs.

Marzehím is situated near a beautiful fertile plain, through which runs a fordable rivulet. I did not go up to the village, which would have taken me out of the way, but proceeded alone, and unfortunately, after much fatigue in ascending Mount Libanus, lost all traces of the road, so that instead of passing to the right which would have taken me to Bisherrá, I had to descend a precipice where the foot of man could scarce find a level space to rest upon, and such as even few quadrupeds would venture to descend.

Towards evening I reached the bottom and slept at an encampment of Arabs, where I was hospitably treated; and the following morning I returned by 'Aïnnete to Bisherrá, having again missed my way.

From Bisherrá I took the road to Tripoli, which, after the first two hours, continues nearly on a level. From Tripoli I continued by the route along the coast passing through Tortosa, Markab, and Latakia,† and crossing the Orontes, reached Suweïydíah on the 22nd of August.

Annexed is a brief account of the late dreadful earthquake in Syria, extracted from the letters of Mr. Moore, British Consul

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* Quercus Ballota.—F. S.

† Properly El Ládhikíyah.—F. S.

at Beïrút, to his Majesty's Government, and from other authentic sources.

January 1, 1837.—At 4 h. 35 m. P.M. the first shock of the earthquake was felt in the city of Beïrút. It was accompanied by a rumbling noise, and lasted ten seconds, and appeared to proceed from the north. No buildings were thrown down in the town; but without the walls seven or eight houses, built on a sandy foundation, fell, and one or two lives were lost. The course of the river Ontilias* (?) near Beïrút was suspended, and the mills on its banks were deprived of water for some hours. When the stream returned to its bed the waters were turbid, and of a reddish, sandy colour. The atmosphere during the day of the earthquake was close, and charged with electricity. Fahrenheit's thermometer stood at 66°, but rose to 70° five minues after the earthquake; for four or five minutes after the shock the compass was still agitated. The weather had been unusually mild and fine during the last few weeks. The oldest inhabitants of Beïrút do not remember so severe an earthquake.

At Damascus, four minarets and several houses were thrown down, the bázárs damaged, and eight or ten individuals killed or wounded.

The cities of Tyre and Sidon were greatly injured.

At Acri, part of the fortifications were overthrown, and several persons killed or maimed.

Tiberias is entirely destroyed; nothing but the baths remaining. The lake rose and swept away many of the inhabitants.

The town of Ṣafet† is a heap of ruins, and nearly the whole of its inhabitants have perished; not more than seven, or by some accounts, not more than five in the hundred, of the population survive; and their sufferings, augmented by exposure to the piercing air of the mountains, without food, shelter, or medical advice, have been very severe. To add to the horrors of their condition, numerous packs of dogs, attracted to the spot by the carcases on which they prey, were rendered thereby so furious, as to be dangerous to the living. The Bedowins also hovered about the ruins for plunder.

Ṣafet is one of the five holy cities whither the Jews resort from all parts of Christendom in old age to die and be interred, and 1500 are now buried in the ruins. Up to the 21st of January shocks of the earthquake continued to be felt daily, and the ground all around was rent into fearful chasms. The amount of

* The river of Beïrút is called Nahr-es-salíb. *Ontilias* is probably an error of transcription: perhaps it should be Wád Iliyás, the river of Elias, as St. George, called by the Arabs Khiḍr Iliyás, is supposed to have suffered martyrdom near Beïrút (D'Arvieux, Mémoires, ii. 376).—F. S.

† Or Safed, Abú-l-fedá (Syria, p. 43, 82).—F. S.

the population is uncertain, but supposed to have been from 6000 to 7000.

The great shock appears to have been simultaneous, and was most sensibly felt to the southward, having extended 500 miles in length by 90 in breadth. It was felt in the island of Cyprus. Forty villages have been totally, and eleven partially destroyed. It were useless to enumerate them here, as the greater part do not appear on any map of Syria yet published. The number of lives lost is stated at about 6000, but it is much to be feared, that in reality they greatly exceed that number.

IX.—*Narrative of a Journey into the Interior of Omán, in 1835.* By Lieutenant Wellsted, Indian Navy. Communicated by Sir John Barrow, Bart. Read April 10, 1837.

In the course of my employment on the survey of the southern and western coasts of Arabia, my attention was constantly directed towards the state of the contiguous provinces, and with this view I undertook several short journeys into the interior; but no opportunity of penetrating, to any considerable distance, occurred until the commencement of the year 1835, when Mohammed Ali dispatched a force from Egypt, in order to take possession of the Coffee country. My proposal to accompany his army in that expedition, for the purpose of endeavouring from thence to reach Hadramaút, was immediately acceded to by the Indian government; but before their sanction could be conveyed to me, intelligence arrived of the Páshá's force having been led into a defile, in the Assaïr country, and there defeated with great slaughter; a miserable remnant alone reaching the sea-shore.

Foiled, therefore, in this quarter, I determined, on my return to Bombay, to turn my attention towards 'Omán, a territory almost as little known as any part of Arabia.

After obtaining the necessary permission, I embarked on board a small schooner (the Cysene) for Maskat,* at which port, after a pleasant passage, we arrived on the 21st of November.

I found Sayyid S'aíd, the Imám of Maskat or sovereign of 'Omán, ready, with his characteristic liberality, in every way to forward my views. Letters were prepared under his own direction to the chiefs of the different districts through which I had to pass, and on November 25th, I quitted that port to proceed to Súr.

Maskat was known to some of the ancient geographers,† as it is probably the Moscha, a port of the Hadramitæ mentioned

* Also spelt with the common k and t; but k and t are probably requisite.—F. S.
† Geographa, Lib. vii. cap. 6, p. 153.

by Ptolemy, noticed also by Arrian in the Periplus of the Erythrean Sea,* as the great emporium of India, Persia, and Arabia. It is situated at the extremity of a small cove in lat. 23° 38′ N., long. 58° 42′ E., at the gorge of an extensive pass, which widens from this point, as it advances into the interior. In its principal features Maskat differs but little from the other eastern towns. Arriving from seaward, its forts, erected on dark-coloured hills, which almost encircle the town, the level roofs of its houses, the domes of the mosques, and their lofty minarets, have an extraordinary and romantic appearance; but as soon as we land the illusion disappears. Narrow, crowded streets, and filthy bázárs, nearly blocked up with porters bearing burdens of dates, grain, &c.; wretched huts, intermingled with low and paltry houses, meet the eye in every direction. There are, nevertheless, within the town some good and substantial houses—the palace of the Imám, that of the governor, and those of some other public officers, are of this description. Maskat is not only of importance, as the emporium of a very considerable trade between Arabia, Persia, and India, but also as the principal sea-port of 'Omán. Its imports are chiefly cloth and corn, the annual value of which is estimated at 3,300,000 dollars, which, if we except Jiddah, is greater than that of the imports into any other sea-port town in Arabia. The customs are fixed at 5 per cent. on all imported goods, but no duties of any kind are levied on exports. These principally consist of dates, rúïvas,† or red dye, much valued in India; sharks' fins shipped off for China, where they are used for making soup, and a variety of other purposes, and salt fish. The returns are made principally in bullion and coffee.

I should fix the population of Maskat and the adjoining town of Matarah at 60,000 souls. They are a mixed race, the descendants of Arabs, Persians, Indians, Syrians, by the way of Baghdad and Basrah, Kurds, Afgháns, Belúches, &c., who, attracted by the equity of the government, have settled there, either for the purposes of commerce or to avoid the despotism of the surrounding countries. The inhabitants are principally engaged in commercial or maritime pursuits, and except ulwah,‡ sugar, and a few rude cloths and cloaks fabricated there, as well as in the inland towns, they have no manufactories in 'Omán. There is no prince in the East whose name ranks higher than that of the Imám of Maskat. He is tolerant, brave, generous, and just, and these qualities have gained him, with the surrounding nations, the title of the second 'Omar.

* Vincent's Periplus.

† Rúïva (in Portuguese) madder, Rubia tinctorum of Linnæus.—F. S.

‡ Ulwah is a compound of sugar, clarified butter, almonds, and flour, and in common use in Arabia.

This prince is particularly distinguished by his abstinence from oppressive imposts and arbitrary punishments; by the protection which he affords to the merchants of every nation who come to reside in his capital, and by the toleration which he extends equally to all religious persuasions; while, on the other hand, his probity, impartiality, and lenience, together with a strict regard for the welfare of his subjects, have rendered him as much respected and admired by the town Arabs, as his liberality and personal courage have endeared him to the Bedowins.

On the way to Súr I touched at Kilhát, which is an ancient town, mentioned by several Arabian authors. Though its remains cover an extensive space, only one building, an old mosque, has escaped destruction. Near the ruins is a small fishing village, the inhabitants of which also employ themselves in digging for gold coins, on some of which the name of the Caliph Hárún al-Rashíd is said to have been deciphered.

On November 28th I arrived at Súr, in lat. 22° 37′, and long. 59° 36′, where, after receiving every attention from the Sheïkh, and making a short journey to the north-westward, which appears on the map, on December 2nd, my camels and guides, to the number of fourteen, being collected, I quitted the town, and proceeded westward to the district of Jaïlán. Súr, the port of this district, is merely a large collection of huts, neatly constructed with the leaves of the date-palm, and erected on either side of a deep lagoon, which also serves for its harbour. It is computed that not less than 200 bagalás* belong to this port; they trade during the fair season to and between the shores of India, Africa, and the Arabian and Persian Gulfs. Its own exports and imports are trifling, and nearly the same as those of Maskat; but the profits derived from their trade are sufficient to support its inhabitants in affluence during the idle season of the year.

On quitting Súr our route continued in a south-westerly direction for twenty miles along a shallow valley, called Wádi Falij.† Rounded masses of limestone form its bed, between which a few stunted bushes, the only signs of vegetable life, force their way. The hills on either hand were of a light red or yellow sandstone, with an occasional streak of orange or purple. From the termination of this valley to Bení-Abú-'Alí, in lat. 22° 3′ N., which we reached December 4th, the country continues flat and uninteresting. My course here was S.S.W., and the direct distance from Súr is forty-two miles.

I may here observe that during the S.W. monsoon, the southern

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* A small vessel, probably from the Bagalá or Baglá, a kind of heron (Ardea Torra).—F. S.

† Idrísí (Geographia Nubiensis), p. 53. Falj, according to Gabriel Iconita, Falij or Falj means stream.—F. S.

coast of Arabia is a dead lee-shore, and neither ships or boats venture to approach it.

Before I reached the encampment of the Benî-Abú-'Alí Bedowins, I was not without some apprehensions as to the treatment I might receive; and my reasons will be best understood when I have stated the circumstances which brought the English into collision with them.

In 1820 Captain Thompson,* who, after the fall of Rás-el-Khaïmah (Cape Tent), and the other pirate ports in the Persian Gulf, had been left on the island of Kishm with a small force of 800 men, principally sepoys, proceeded to Súr, where he formed a junction with the troops of the Imám, and advanced against this tribe, who, it was believed, had been engaged in acts of piracy. The Benî-Abú-'Alí Bedowins permitted their enemies to approach within a short distance of their fort, and then, as they were sweeping round a date-grove, attacked them on their flank (which was but a few yards from it) with so much fury, that nearly the whole of the force was cut to pieces. Captain Thompson, two officers, and not more than 50 or 60 men, alone succeeded in reaching the sea-shore.

Intelligence of this defeat had no sooner reached India, than a larger force of 3000 men, under General Sir Lionel Smith, was dispatched against them.†

Nowise daunted by their superior numbers, the Bedowins again quitted their fort, and met the British force on a large plain contiguous to it. Their numbers did not exceed 800, and many of their females fought in their ranks. They rushed on with the same impetuosity as before; nor was it until more than two-thirds of their number were slain, or desperately wounded, that they gave up the contest.‡ Many of the survivors were taken prisoners of war to India, and after being confined there for some time, were furnished with presents, and sent back to their own country. Since this period no European had held any intercourse with them.

As soon after entering their territories as possible, I proceeded to the tent of their Sheïkh, and immediately proclaimed myself an Englishman, desirous of passing a few days with them.

I had no sooner made this known, than the whole tribe was in a tumult of acclamation. The few old guns they had were fired from the different towers, matchlocks were kept going till sunset, and both old and young used their utmost efforts to entertain me. They pitched my tent, slaughtered sheep, and presented me with

* See Captain Thompson's Report, dated 18th November, 1820, Asiatic Journal, vol. xi., p. 593.

† In January, 1821.

‡ In March, 1821.—Asiatic Journal, xii., 364.

milk by gallons. In truth, I was not a little surprised at a reception so truly warm and hospitable.

Before me lay scattered the ruins of the very fort we had dismantled; my tent was pitched on the same spot where we had nearly annihilated their tribe: thus reducing them from being the most powerful in 'Omán to their present petty state. All, however, in the confidence I had shown in throwing myself amidst them, was forgotten. Notwithstanding we may entertain very different sentiments respecting our first attack on this people, and it is known that the Indian government subsequently did so; yet the whole affair being quite to a Bedowin's taste, both here and in every other quarter, I heard nothing but praises of the English. "We have fought, you have made us every compensation in your power for those who fell, and we should now be friends," observed the Sheïkh's ladies, when speaking to me afterwards of the transaction.

After passing a few days with this grateful people, I proceeded to the south-westward over the great desert, and have little doubt that I should have found no considerable difficulty in reaching the celebrated country called the Maharah district, on the south-east coast of Arabia, but 'Omán, yet unexplored, was before me.

On the first day, December 6, our route, with little variation, was about south-south-west, and as we were mounted on good camels, the extent of country we passed over was forty-five miles. For two-thirds of this distance the face of the country was level, but intersected with the traces of numerous torrents. From thence to our halting place we threaded our way amidst sandy mounds, topped with acacias, and encamped near some wells of brackish water.

On the 7th, continuing over the same country by about west by south-half-south, we arrived at a Bedowin encampment, where there are also wells.

From thence we returned in a north-north-easterly direction to Beni-Abú-'Alí, crossing in our course several extensive plains, covered with a saline efflorescence.

Quitting this encampment, December the 10th, we followed in a north-westerly direction the shallow valley of Wádí-Bethá, and on the 12th arrived at Bedí'ah. My course from Beni-Abú-'Alí to this point was north 52° west, and its distance, in a direct line, is 42 miles.

Here there are seven hamlets, situated within oases, which are watered by subterranean rivulets, sometimes conveyed to them by artificial means, from the distance of four and even five miles. Thus abundantly irrigated, these isolated spots possess a soil so fertile, that nearly every grain, fruit, and vegetable common to India, Persia, or Arabia, is produced almost spontaneously;

and the tales of the oases will no longer be regarded as an exaggeration, since a single step conveys the traveller from the glare and sand of the desert to the richest soil, moistened by a hundred rills, teeming with the most luxuriant vegetation, and embowered by noble and stately trees, whose umbrageous foliage the fiercest rays of a noontide sun cannot penetrate. The almond, fig, and walnut-trees grow to an enormous size, and the fruit appears clustered so thickly on the orange and lime, that I do not believe a tenth part of what they afford is ever gathered. Above all towers the date-palm, and lends its grateful shade to protect the jaded traveller. Some idea may be formed of the density of this mass of foliage by the effect it produces in lessening the terrestrial radiation. Fahrenheit's thermometer, which within the house stood at 55°, at six inches from the ground fell to 42°.

From Bedí'ah I continued to pass through a succession of other oases, which appear on the map, but having no peculiarity beyond what I have described, the insertion of a mere list of their names in this paper would serve no good or useful purpose.

On December the 13th we arrived at Ibrah, which is an old town, containing several handsome houses. The style of building is quite peculiar to this part of Arabia. To avoid the damp, and to catch an occasional beam of the sun above the trees, they are usually very lofty. A parapet leading around the upper part is turreted, and on some of the largest turrets guns are mounted. The windows and doors have the Saracenic arch; every part of the building is profusely decorated with ornaments of stucco in bas-relief, some of them in very good taste. The doors are also cased with brass, and have rings and other massive ornaments of the same metal.

Ibrah is in lat. 22° 41′, bears north 42°, west from Bedí'ah, distant 22 miles.

Quitting Ibrah on December the 13th, our course still along Wádí Bethá, having on either hand plains dotted with grassy knolls, we arrived December the 16th at Semmed, an extensive Oasis, situated in lat. 22° 50′. In the vicinity of this town there is a large fort, garrisoned by the Imam's soldiers.

From Semmed I proceeded to Minnà, which town I reached on the 21st of December. Minnà differs from the other oases in having its cultivation in open fields. As we crossed these, with lofty almond, citron, and orange-trees, yielding a delicious fragrance on either hand, exclamations of astonishment and admiration burst from us. "Is this Arabia," we said, "this the country we have looked on heretofore as a desert?" Verdant fields of corn and sugar-cane, stretching along for miles, were before us; streams of water, flowing in all directions, intersected our path, and the happy and contented appearance of the

peasants agreeably helped to fill up the smiling picture. The atmosphere was delightfully clear and pure; and as we trotted joyously along, giving or returning the salutation of peace or welcome, I could almost fancy we had at length reached that "Araby the blest," which we had hitherto regarded as existing only in the fictions of our poets.

On December 23rd I arrived at Neswah,* in lat. 22° 56′, which is the largest and most populous of all the oases. Here I arranged with the Sheïkh for other guides, to proceed to the Jebel-Akhdar, or green mountains, which had been described to me as elevated, populous, and fruitful.

Many obstacles were thrown in my way, but by patience and a few well-timed presents, I overcame them. Proceeding to Tanúf, situated at the gorge of the pass, I obtained asses, which for size, sturdiness, and sureness of step, are scarcely inferior to mules. Mounted on these, I found but little difficulty in ascending to the summit of the range, on which I passed several days.

The Jebel-Akhdar extend, from east to west which is their greatest length, a distance of thirty miles. At right angles to these they are intersected by narrow deep valleys, along which on either side the torrents descend during the rainy season, and either lose themselves in the sandy soil, while crossing the plain below, or convey their water into the ocean.

Taken generally, the range by no means deserves the appellation it has received of green; for a great proportion of its surface is bare limestone rock, which presents, in some places, naked tabular masses; and in others, the shallow deposit which is lodged in the hollows, is as poor as the worst part of the plains. But the valleys and several hollows are extensively cultivated, and supply such abundance of fruit and other productions, that they have been considered as common to the whole range, and hence its name of "Green."

I ascertained by means of several observations on the temperature of boiling water the highest points of the range to be 6000 feet above the level of the sea. In the winter season, after rain, they have, therefore, not unfrequently ice and snow; and the climate, even in the summer season, must be very temperate.

At the period of my visit it was winter, and the trees in the several valleys were all stripped of their leaves; but in the summer, when everything is in bloom, it must be a delightful resi-

* Niebuhr's Nissuwa, *i.e.* Nizzuwah, the Tama of the printed Epitome of Idrísí, Geogr. Nubiensis, p. 54. It is نزوه in both the MSS. at Oxford.—F. S.

Niebuhr, who placed it from such information as he could obtain, has it in 22° 52′ N.

dence. Water, gushing from several springs, never fails them, and affords abundant means of irrigation.

The Bení-Riyám, who inhabit this range, differ in many respects from their neighbours of the plains. Although their number does not amount to more than 1000 men, yet from the steep, rugged, and dangerous nature of the passes, which frequently lead through defiles, where a few resolute men might make a good stand against a thousand; and also the strong positions which they have chosen for the erection of their villages, there is every reason to believe their assertion, that they have never known a master.

In their persons, although tall and muscular, yet they have not the usual healthy and hardy look of mountaineers; but on the contrary, their faces are wrinkled and haggard, and they appear as if suffering from premature decay.

They are addicted to an immoderate use of wine, which they distil from their grapes in large quantities, and partake of openly and freely at their several meals. They defend the practice, by asserting that the cold renders it necessary.

This wine, in flavour and appearance, bears a close resemblance to that brought from Shiraz; large quantities are taken in skins to the surrounding countries, and to the sea-coast, where it is sold publicly. In the winter season the men leave the culture of the vines to the women, and having nothing to do themselves, pass their time within their houses, until the sun is sufficiently high to warm them, and then they crawl forth to bask in it. The inhabitants of the plains consider the Bení-Riyám in other respects as an irascible, slothful, and immoral race, and bring against them a still heavier charge,—that of being niggard and sullen in the exercise of their hospitality;—and certainly what came under my observation during my stay among them, produced little which could be advanced in contradiction of such accusations.

During my stay on these mountains, I remained at the small hamlet of Shírází, in lat. 23° 3′ N.

On December 31st I returned to Nizzuwah, and employed myself from thence till the 11th of January in making short journeys to the desert. On these occasions I mixed much with the inhabitants, frequently living and sleeping in their huts or tents with them. On all occasions I was received with kindness, and often with a degree of hospitality, above rather than below the means of those who were called upon to exercise it; and I was enabled to collect, in consequence, much new and interesting matter, connected with the domestic habits and condition of this interesting race.

From the 10th to the 15th I remained in Nizzuwah, employing

myself with my map, and transcribing my journal. During this period I was compelled to lodge at a small house within the oases, where the vegetation clustered thickest. My servants were first attacked, and then myself, with most violent fever; I was delirious forty-eight hours after its first appearance, and from thence to the 18th was insensible to all that passed. Some Arabs, sent by the Sheïkh, took care of me, I believe, for a part of this time, and the fever on that day reached its height, a favourable change took place, and I regained possession of my faculties, though much reduced and debilitated. But to proceed further in our present state of health was impossible, and to remain where we were was to destroy the only chance of the recovery of the other patients, who were now sinking fast. I was consequently obliged to direct my course, by short and easy journeys, to Síb on the sea-coast, which is justly celebrated for the salubrity of its climate. We reached this town on January 30th, and remained recruiting our health until the 25th of February.

A few days previous to quitting it I wrote to the Imám of Maskat, requesting he would furnish a guide to conduct me to Bìreïmah, the frontier station of the Wahhábís. From hence I had, though the season was far advanced, but little reason to doubt my being able, with some káfilah (caravan), yet to reach Der'ayyah.* My disappointment was, therefore, very great to learn from his highness, in reply, that the Wahhábís had but a few days before made a sudden irruption into the northern parts of 'Omán; that they had seized, plundered, and burnt several towns near to Sohár; that the inhabitants of Obrí, on the road to Bìreïmah, were engaged in hostilities against their neighbours; and that his highness would most strongly recommend, in the present unsettled state of affairs, that I should not continue my journey. I never, however, contemplated being able to complete the duty on which I was employed without risk, and this was an occasion involving in itself the examination of nearly half the province, which appeared to justify the exercise of it to the fullest extent; nor did I as yet despair, if I could reach Bìreïmah, of being able to pass on to Der'ayyah. I therefore, with many acknowledgments for his kindness, communicated my wishes to the Imám, and I was well pleased on the morning of the 24th to find a most respectable old man, well known throughout the country, at my tent in perfect readiness to accompany me.

We reached Suweïk † on the 29th of February, and received

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* The capital of the Wahhábís, in the Wádí Bení Haníf́ah. It is one of the two defiles by which alone the Nejd-el'árid can be entered.—Jehán numá, p. 527.—F. S.

† The little market.—F. S.

during our short visit there much hospitality from its Sheïkh Seyyid Helál, who obtained for us camels to conduct us to Obrí. We quitted Suweïk on Friday the 4th of March. The groves and cultivated ground extend about three miles from the beach; beyond that the plains are crossed by many shallow streams, which had originated among the hills during the late rains; very large acacia-trees dot the surface of either, and seated beneath their scanty and feathery shade, might frequently be seen an Arab shepherd with several enormous dogs to aid him in his charge of the flock; but his pipe and crook are wanting; their place is supplied with matchlock and spear.

On March 5th we arrived at Sedá, in lat. 23° 45′, and situated at the gorge of a pass, where it emerges from the mountain chain, which runs parallel to the coast. From thence we proceeded through Wádí-Howásanah to Makiniyát, which was once a large city, but is now nothing more than a straggling village. It has never, I understood, recovered from a visit which the Wahhábís paid to it in 1800. They then took the castle, burnt the houses, and destroyed the greater number of the trees. By a noon observation of the sun, and several meridional transits of the stars, I fixed the latitude of Makiniyát at 23° 21′ 25″ N.

Quitting Makiniyát on March 11th, we continued our journey towards Obrí. Our route, until we reached Ayal, was along a broad valley; on either side the hills run in a table-topped range with sloping sides, or are broken into detached chains, presenting isolated pyramidal hills, somewhat truncated on the upper part, but of the same uniform level and direction as the continuous ridges.

From Ayal we passed a succession of sandy and barren plains, and on March 12th arrived at Obrí.

Owing to the very unsettled state of the country it was not without some delay, and after encountering considerable personal risk, that we succeeded in reaching this place, and when we had done so, great was my vexation and annoyance to find myself amidst an army of 2000 Wahhábís, then in possession of it. They were proceeding to attack the district of Bediáh, a portion of the Imám's territories; and when they discovered we had been travelling under that prince's protection, matters wore a very serious aspect, and it was not without difficulty that I succeeded in escaping from the town without being either pillaged, or murdered. Foiled in this quarter, I therefore again returned to Suweïk, and from thence proceeded, touching at the several intermediate towns, in a boat to Shinás, where I again made an unsuccessful attempt to reach Bireïmah.

When we returned the season was so far advanced that I was compelled to quit the coast for India.

I have subjoined a few observations on the general features of the country.

'Omán may be described as a narrow strip of land of irregular width, but never exceeding 150 miles. It is bounded on the east by the Indian Ocean, on the west by extensive deserts, and extends in a direct line from the Island of Mazura, in lat. 20° 18′, and in long. 58° 56′ nearly 400 miles to Rás or Cape Musendom, in lat. 26° 24′, and long. 56° 39′, where it terminates in the form of an acute angle.

By the natives of the country this part of Arabia is subdivided into four districts. 1. Jaïlán, comprehending Bení-Abú-'Alí, and all that tract of country to the south-east of Bediáh; 2. 'Omán, from Bediáh north-west to Makiniyát; 3. Dhorrah, from Makiniyát to Bìreïmah; and 4. Batna, extending in a narrow strip along shore from Síb to Khórfakán.*

The general features and outlines of the province may be thus laid down. A range of mountains, forming a part of the great chain which almost encircles Arabia, traverses in a direction nearly parallel to the shore, the whole extent of the province from Maskat to Súr. The hills take their rise close to the beach, but to the north of that port they retreat considerably from it.

In lat. 23° a second range, Jebel-Akhdar, or green mountains, still more elevated, run in a direction nearly transverse to the former; low parallel ridges, forming the roots of either branch, extend to a considerable distance from them.

From the Jebel-Akhdar the chain continues to Rás-Musendom, throwing off in its course thither another branch which extends to Rás-el-Khaïmah on the shores of the Persian Gulf. The space included within this bifurcation and the sea is broken into piles of mountains, which are singularly disposed, and of various elevations. The width of the chain does not in general exceed twelve or fifteen miles, and the average height of the central and most elevated hills is from 3000 to 3500 feet. Some of the highest points of the Jebel-Akhdar rise, however, nearly 6000 feet above the level of the sea. With the exception of this range they are not wooded and barren. Felspar and mica-slate enter most commonly into the formation of the lower ranges, and primitive limestone the upper.

By the map and narrative it will be seen that from Bení-Abú-'Alí to Nizzuwah I traversed a line of oases, and that the space between them and the mountains on the sea-shore presents nothing but arid plains, destitute of either towns or villages.

To the northward of Síb the width of the Tehámah, a maritime plain (the Batna of the map), is from twenty to forty miles.

* Pronounced Khúrfakán by the Persians, who commonly give that sound to the final *an*.—F. S.

It rises with a slight but gradual ascent from the sea to the base of the principal chain; and although not crossed by any of the rivers which appear on our maps, it has, nevertheless, some considerable streams, which continue for the greatest part of the year to pour their waters into the sea.

Beyond, or to the westward of the mountains, in the northern districts, few towns or fertile spots occur, and in some instances the margin of the desert is but a few miles removed from them. From the summit of the Jebel-Akhdar, I had an opportunity during a clear day to obtain an extensive view of the desert to the south-west of 'Omán. Vast plains of loose drift-sand, across which even the hardy Bedowin dare scarcely venture, spread out as far as the eye can reach. Not a hill, nor even a change of colouring in the plains occurs, to break the unvarying and desolate appearance of the scene. 'Omán may, therefore, be described as a desert, thickly studded with oases, and containing amidst its mountains many fertile valleys, yet many of these are at a considerable distance from each other, and it must be admitted that the quantity of cultivated country bears but a small proportion to that which is incorrigibly barren; for the intermediate space between the oases to the westward and the Great Sandy Desert is an arid and barren plain, either sandy or clayey, according as the aluminous or siliceous particles prevail.

It will be seen by the map that there are several large towns on the sea-coast; but with the exception of Rosták, which is extensive and well built, there are none of any extent in the interior. Many of those which, from native information, have figured in our maps as large cities, and are even classed by Niebuhr as principalities, do not now rise into more importance than villages or hamlets. The ruins of houses, and the remains of former embankments, denote however both a superior population and more extensive cultivation; but wherever irrigation ceases, the course of a few seasons converts the land, however fertile it may have previously been, into a desert. The whole of these towns are now either situated within or contiguous to an oasis.

The direction of my several journeys is pointed out in the map. In order to show the degree of confidence to which this may be entitled, it is necessary that I should state, that all the principal towns, villages, and oases are fixed from actual observation, and with the exception of Rosták, which is placed in the position it occupies from compass bearings, and Bireïmah, the frontier station of the Wahhábís, there is no place of importance in 'Omán, the geographical site of which has not been correctly determined.

X.—*Extracts from the Diary of an attempt to ascend the River Santa Cruz, in Patagonia, with the boats of his Majesty's sloop Beagle.* By Captain Robert Fitz Roy, R.N. Read May 8, 1837.

April 17*th*, 1834.—An examination, or rather the partial exploring, of the great river Santa Cruz, had long been meditated. During the former voyage of the Beagle, Captain Stokes had ascended the rapid current as far as his heavy boat could be taken. His account increased our curiosity, and decided my following his example. Three light boats were prepared (whale-boats strengthened); as much provisions as they could stow with safety were put into them; and a party of officers and men selected.

18*th*.—Early this morning we left the Beagle, and sailed up the estuary, into which the river flows, with a favouring wind and flood-tide.

In case any one should read these notes who has not visited the eastern coast of Patagonia, I will endeavour to describe the vicinity of the Beagle's anchorage in the Santa Cruz.

A wide, turbid, and very rapid river rushes through a confined opening into the ocean, during about seven hours, and is opposed and driven back by the flood-tide during other five hours of the twelve. On each side of the river are extensive—to the eye, boundless—plains of arid, desert land. But these plains are not on the same level. On the *northern* bank the land is but little higher than the level of high spring-tides; while on the southern side of the river, high perpendicular cliffs are strikingly contrasted. After ascending these heights by any of the ravines which intersect them, one finds a dead level expanse, similar in every respect to that on the northern shore. In the horizon, another 'steppe,' or parallel plain, at a higher elevation, is seen.

Excepting in the Porphyry districts, all the *eastern* coasts of *Patagonia*, and the *little* of the interior which I have seen, appeared to me to be a similar succession of horizontal ranges, or level lands, of various heights, intersected here and there by ravines and water-courses. There are, certainly, hills in many places, which appear to the eye, passing at sea, or in the distance, conical, or, at all events, peaked; but even those hills are but the gable-ends, as it were, of narrow, horizontal ranges, or ridges of land, higher than the surrounding country.

Brownish-*yellow* is the prevailing colour, lighter or darker, as the sun shines or is obscured. Here and there, in hollow places or ravines, a few dark-looking shrubby bushes are seen; but over the wide desolation of the stony, barren plain, not a tree can be discerned. Scattered herds of ever-wary guanacoes, startled at

your approach, neighing, stamping, and tossing their elegant heads; a few ostriches, striding along in the distant horizon; and here and there a solitary condor, soaring in the sky, are the only objects which attract the eye. Certainly, if one looks *closely*, some withered shrubs, and a yellow kind of herbage, may be discerned; and, in walking, thorns and prickles assure one, painfully, that the plain is *not*, in truth, a *desert:* but I am quite sure that the general impression upon the mind is that of utter, hopeless sterility.

Is it not extraordinary, that sea-worn, *rolled*, shingle-stones, and alluvial accumulations, compose the greater portion of these plains? How vast, and of what immense *duration*, must have been the action of those waters which smoothed the shingle-stones now buried in the deserts of Patagonia!

Fresh water is seldom found in these wastes; salinas (salt depositions or incrustations) are numerous. The climate is delightful to the bodily sensations; but for productions of the earth, as bad as any, excepting that of the Arabian or African desert. Rain is seldom known during three-quarters of the year, and even in the three winter months, when it may be expected, but little falls except on *rare* occasions, when it rains for two or three days in succession. Sea-winds sometimes bring small, misty rain for a few hours, but not enough to do good to vegetable produce.

The only animals which abound are guanacoes, and *they* have *often* been seen drinking salt water. The puma quenches its thirst in *their* blood. Of other animals supposed to require much liquid sustenance, there are none in these regions.

Generally, a bright sunny day is succeeded by a cloudless and extremely clear night. In summer the heat is scorching, not sultry. In winter the weather is sometimes searchingly cold, especially during southerly winds. Changes of wind are sudden, and cause extreme variations of temperature. Sometimes the sky is slightly or partially overcast, occasionally clouded heavily, but on most days a bright sunshine, and a fresh, or strong westerly wind, may be expected.

The confluence of a large and continual torrent of fresh water and the great tides of the ocean, which here rise forty feet perpendicularly, has embarrassed the mouth of the Santa Cruz with a number of banks. They are all composed of shingle and mud, and alter their forms and positions as affected by river floods, or by the heavy seas caused by south-east gales.

Into the entrance of the Santa Cruz the flood-tide sets about four knots an hour, or, it may be said, from two to five knots, according to the time of tide, and the narrower or broader part of the opening. Outwards, the water rushes, at least, six knots, on

an average, in the mid-channel. In places, and at times, when acted upon by wind or unusual floods, it does not run with a velocity less than seven or eight knots an hour, perhaps even more. (I am speaking of the mid-channel, or fairway.) Near either shore, and in the bights between projecting points, of course the strength of the outward as well as inward current is very inferior.

In such a bight, close to the high cliffs on the southern shore, the Beagle was moored. One may readily conceive the different views presented in this situation, with forty feet change in the level of the water. At high-water, a noble river, unimpeded, moves quietly, or is scarcely in motion. At the other time, a rushing torrent struggles between numerous banks, whose dark colour and dismal appearance adds to the effect of the turbidly yellow water, and naked-looking, black, and muddy shores.

The boats sailed up the river between some of these banks, with a fresh southerly wind, disturbing immense flights of sea-birds. Here and there a monstrous sea-lion lifted his unwieldy bulk a few inches from the stony bank, lazily looked around, and then, with a snort and a growl, threw his huge shapelessness, in a tumbling waddle, towards the nearest water.

As far as Weddell's Bluff (named after the enterprising southern navigator) we sailed merrily. There the river makes a sudden turn; and we took to the oars. A little above the Bluff, the water was fresh on the surface: *sometimes* it is *entirely* fresh, even into the estuary.[1] But in filling casks, or dipping anything into the stream for fresh water, it is advisable not to dip deep, or to let the hose, if used, go many inches below the surface, since it often happens that the upper water is quite fresh, while that underneath is salt. But this occurs, more or less, in all rivers which empty themselves into the sea.

Wind failing, we pulled to the south-west. On our left, high cliffs still continued. At their base, a wide shingle beach offered tempting landing-places, and many spots extremely well adapted for laying a vessel ashore to be repaired or cleaned. On the right, a low shore extended, rising, however, in the north-west (on the *south* side of the north-west arm of the Santa Cruz), to cliffs.

The flowing tide favoured us until about five, when we landed on the north shore, at a spot where the rise and fall of the tide had diminished to four feet. Here the river was 640 yards in breadth, and running (*always*) down at the rate of about six knots during a part of the ebb, and from two to four knots an hour during the greater part of the flood-tide. It was *perfectly* fresh to the bottom, and in mid-channel about three fathoms deep.

But this depth extended very little way across: the deep channel being extremely narrow—not more than twenty yards in width. The distinct difference between the opposite banks of the river had diminished, until, at this spot, the two sides were much alike. We had left the cliffs and the salt water, and had fairly entered the fresh-water river. Instead of having a wide extent of dismal-looking banks and dark-coloured, muddy shores, we were at the side of a rapid stream, unvarying in width, on whose banks shrubs and grass agreeably relieved our eyes from muddy shingle covered with hosts of crabs.

Our first night passed well. Early next morning some of the party went upon the nearest hills to look for guanacoes.

I ought to have mentioned that we had entered a tract of country whose surface appeared to the eye irregular and hilly; but upon ascending the heights it was seen that though the river ran in a large valley, the general character of the country was similar to that which I previously described. Those which appeared to be hills, we found to be the terminating sides of extensive plains, whose level was about 300 feet above the river. Near the fresh water, shrubs, bushes, and grass were not scarce; but everywhere else, a sterile, stony waste met the eye.

From the heights, for a considerable distance, we could trace the windings of the river, and were sorry to see a great number of small islands, thickly covered with brushwood, which seemed likely to impede our progress, if obliged to track the boats.* The southerly wind blew keenly over the high land. The surface of the ground was frozen hard; but the air was healthy, fresh, and bracing. Where could it be purer than on these dry hills?

18*th.*—At first setting out this morning we tried the oars, but soon found that they were unable to contend with the strength of the stream. Landing all our party, except two in each boat, we made the boats fast to one another, at a few yards apart, in a line a-head. Then taking the end of a coil of whale-line a-shore, half our party fixed themselves to it by the laniards of broad canvas straps, which passed across their breasts, and over one shoulder, and walked along the river's bank. The bight of the line was passed round a stout mast, stepped in the headmost boat, and attended by the two men in the boat, who veered away, or shortened in the line, as the varying width of the stream or impediments rendered necessary.

In this manner, one-half of the party relieving the other half about once an hour, we made steady progress against the stream of the river, which increased in rapidity as we ascended, until its usual velocity was between six and seven knots an hour. Every

* Pull them along by a rope.

one took his turn at the track-rope, or tow-line. While among the islands which I mentioned, tracking was difficult and tedious. Many were the thorny bushes through which one-half of the party dragged the other half—once in motion, no mercy was shown. If the leading man could pass, all the rest were bound to follow. Many were the duckings, and serious the wear-and-tear of clothes, shoes, and skin.

At intervals stoppages were made for refreshment and observations. Three chronometers were carried, with other necessary instruments, among which were two mountain barometers, with which Mr. Darwin wished to measure the height of the river above the level of the sea, and the heights of neighbouring ranges of hills above the level of the river.

This afternoon we picked up, upon the south bank of the river, a boat-hook, which was immediately recognized as one which had been left by accident, sticking in a mud-bank, by the party who accompanied Captain Stokes in his excursion up this river in the year 1827.

19*th.*—It was very cold at our bivouac this night. A sharp frost. While observing the moon's meridian altitude, at about nine in the evening, the dew fell so fast upon the roof of the artificial horizon, and froze so quickly as it fell, that I could hardly make the observation. The sextant was injured by the frost—not having been used before in very cold weather; the brass contracted so sensibly as to injure the silvering at the back of the index-glass, and change the index-error. The thermometer in the open air was at 22°. Probably *warm* weather to Polar voyagers; but to us, accustomed to temperate climates, it was a considerable degree of cold.

20*th.*—As we were going along the bank of the river, which to our great benefit was become more accessible and clearer of bushes, we saw some dark coloured animals crossing the stream at a distance, but no one could guess what they were, until the foremost of them reached the shore, and rising upon his stilt-like legs, showed himself an ostrich. Several of those birds were swimming across. I had no idea that so long-legged a bird, not web-footed, would, of its own accord, take to the water and cross a rapid stream. There were six or seven following one another.

We saw smoke at a distance, and anticipated meeting Indians. The country around was similar to that already described. Islands no longer impeded our progress; but some high cliffy banks gave trouble. At the next place where we passed a night Mr. Darwin tried to catch fish with a casting net, but without success; so strong a stream being much against fishing.

21*st.*—A very sharp frost again this night. We proceeded as usual, dragging the boats up the stream, (or rather torrent, for it

never ran less than six knots, and in many places more,) at the rate of about two miles an hour. Having approached near the smoke, we chose our position for the night, rather cautiously, upon a little peninsula.

22nd.—We had not advanced a mile this morning when fresh tracks of Indians, on horseback, carrying their long chuzos, or lances, aroused our vigilance. We thought they had been reconnoitring our party at day-light, and perhaps it was the case. The smoke of their fires was seen behind the nearest range of low hills on our side of the river. We were *then* on the north bank, but *had* been tracking the boats on *either* side, as better ground for walking was found.

Cautiously proceeding, we at last arrived at the spot whence the smoke had issued, but saw no human beings. Marks of very recent fire, and numerous tracks of feet upon a soft muddy place at the side of the river, showed that a party of Indians had lately crossed over. A smoke rising on the southern shore, told where they were gone. At this spot there was about an acre of good pasture land by the water-side; and the breadth of the river itself was something less than usual: reasons which had induced the natives to select it as a crossing place.

To cross a river, running at the rate of six or seven miles an hour, and about two hundred yards in width, can be no easy task to women and children. But as we saw many prints of very small feet on the muddy bank, both women and children must have crossed at this place with the men. How did they get over? There is no wood, neither are there rushes, with which they might make balsas.* Perhaps some of the women and children were put into rough, coracle-like boats, made of hides sewed together, and towed across by the horses, holding by whose tails the men swam, and perhaps some of the women. This method of holding by the tail, while swimming, is said to be better than resting a hand upon the horse's neck and holding by the mane. None of the Indians sit upon their horses while swimming.

22nd.—This afternoon we passed two places where the stream of the river ran so violently that we considered them rapids, and had much difficulty in passing, even with all hands upon the rope. The night of the 22nd was not so cold as the preceding; but we always found the nights wintry, though the days were warm, and generally we were annoyed by the heat of the sun. Besides the strength of the stream, we had to contend with high cliffs, over whose upper edges it was difficult to convey the tow-line: but we made some progress—about twelve miles.

So winding was the course of the river that we certainly walked

* Floats or rafts.

double the distance advanced in a direct line. Very little of interest, as a picturesque subject, had yet been seen. No country except a desert could wear a more triste unvarying appearance.

Immense accumulations of shingle, imbedded, as before mentioned, in alluvial deposition, formed the banks and the level plain, or valley, through which the river pursues its very winding course. The width of this valley varies from one mile to five miles; and the level of the shingle plain is from three hundred to one thousand feet below that of the adjacent higher, but still horizontal, ranges, whose broken down ends, or sides, form the boundaries of the valley through which the river flows.

The sides, or ends, of those higher ranges look like hills when one is in the valley: it is not until after ascending to their summits that their real nature is seen. Instead of inclining to consider those heights as hills, one is then disposed to think the valley of the river a vast excavation, formed below the level of the neighbouring country. But, above or below, all is an unprofitable waste. Scarcely could we find bushes enough, even near the river, to make our fires. Even the wiry, half-withered grass, upon which the guanacoes feed, is so scanty that they are obliged to wander over much ground in search of their food. The few stunted bushy trees, which are found here and there near the river, are thorn trees of the country, whose wood is extremely hard and durable.

The night of the 22nd we passed by the side of a little cove, which sheltered the boats from the strength of the stream; and, as all hands were tired, we rested during the morning of the 23rd.

23rd.—After noon we continued, and at dark stopped on the south shore. Scarcity of wood and a cold night made it necessary to take good care of the wood when cut. There may be honour among thieves, but there was little to be found during a cold night among our own party. The fire of those who happened to be on watch was sure to blaze cheerly, at the expense of the sleepers.

24th.—I noticed more than usual the curious effect of the water of the river being so much warmer than the air over it. The water at daybreak, and until after sunrise, was smoking as if it were boiling: the temperature of the air being 30°, that of the water 46°.

This day we passed some high cliffs, between two and three hundred feet in height. It was extremely difficult to manage the boats and tow-lines, where they came in our way; but by veering out a great length of rope, our object was accomplished without disaster. Near these cliffs the valley of the river began to contract and become more irregular: the breaking down of the higher

ranges was more abrupt and closer to the river. In most places a cliffy side was opposite to a low projecting point of shingle; but in some we passed to-day both sides were high, and we had no choice. The difference also between the level of the higher ranges, and that of the river, was much increased.

25th.—Difficult places, delays caused by embarking and disembarking frequently, to change banks, or avoid impediments, necessary observations, rest, and meals, occupied so much time that we did not average more than twelve miles in one day; and even that small distance was not accomplished without making both shoulders and feet sore.

26th.—In the distance some very level topped, dark-looking cliffs were seen at the summits of the higher ranges, which Mr. Darwin thought were a capping or coating of lava. Of course we were very anxious to verify a fact so curious, and at noon were quite satisfied, having approached to the foot of a height so capped, whose fragments had in falling not only scattered themselves over the adjacent plain, but into the bed of the river, in such a manner as to make the passage of the boats exceedingly dangerous. Large angular masses, in some places showing above the stream, in others hidden beneath, but so near the surface that the water edded and swelled over them, menaced destruction to the boats as they were with difficulty dragged through the eddying rapid. Sometimes the rope caught under, or around, one of those masses, and caused *much* trouble.

Near the spot where we stopped at noon was a glen, quite different in character from any place we had yet passed. Indeed, upon entering the lava district, or that of the country over which lava formerly flowed, there was no longer a Patagonian aspect around. Steep precipices, narrow winding valleys, abundance of huge angular fragments of lava, a more rapid and narrower river, and plains of solid lava overlaying the whole surface of the country, make this even worse than Patagonia. Excepting in an occasional ravine, nothing grows. Horses could not travel far, the ground being like rough iron. Water, away from the river, is very scarce.

The glen I mentioned above is a wild-looking ravine bounded by black lava cliffs. A stream of excellent water winds through amongst the long grass, and a kind of jungle at the bottom. Lions (pumas) shelter in it, as the recently torn remains of guanacoes showed us. Condors inhabit the cliffs. Imperfect columns of a basaltic nature give to a rocky height the semblance of an old castle. It is a scene of wild loneliness, fit to be the breeding-place of lions.* No signs of human visitors were discovered. The nature of the country must prevent horsemen from traversing those

* Leonum arida nutrix.

regions. Food for man is abundant, but there is very little for horses. Only in glens or ravines such as this can any grass or bushes be found. Guanacoes swarm upon the heights; owing, probably, to their being undisturbed: they spread over the country like large flocks of sheep.

During a long walk this evening, Mr. Stokes and I were repeatedly disappointed by the *mirage* over an extensive stony plain, between two bends of the river. We were very thirsty, and walked from one apparent piece of water to another, in eager haste, only to be tantalized.

27th.—Similar country. On the bank of the river some drift-wood was found—the trunks of trees of considerable size. The trunks of small trees had been found by the side of the river, from time to time, but none so large as these—from one foot to two feet in diameter, and about thirty feet in length. The wood appeared to be sauce,* of the red kind. That these trees had been drifted from a great distance was evident, because they were much water-worn.

28th.—In passing a rapid, whose difficulties were much increased by rugged blocks of lava, lying in the bed of the river, one of the boats was badly stove, and barely rescued from sinking in the middle of the stream. We got her on shore and patched her up.

No change in the scenery. No signs of inhabitants. Dull heavy work.

29th.—While upon a high range of lava-capped land, Mr. Darwin and Mr. Stokes descried distant mountains, covered with snow. At last then the Andes were in sight! This was inspiriting intelligence to the whole party, for small had been our daily progress, though great the labour.

The river had increased in rapidity, though but little diminution had taken place in the quantity of water brought down. The breadth was rather less, certainly, but the depth in most places greater. No fish had yet been caught; indeed, only two had been seen. They seemed to be like trout.

30th.—The snowy summits of the distant Cordillera were more distinctly seen from the heights. These heights rise about 1000 feet above the level of the river, which here is about 300 feet above the level of the sea.

Two guanacoes were shot by Mr. Darwin and Mr. Stokes. They covered them up with bushes, and hastened to the boats to ask for assistance. Some of our party went with them to bring in the animals, but the condors had eaten every morsel of the flesh of one animal. The other they found untouched, and brought to the boats. Four hours had sufficed to the condors for cleaning

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* A kind of willow.

every bone. When our party reached the spot, several of those great birds were so heavily laden that they could hardly hop away from the place. Some of our party had much amusement with the guanacoes upon the heights, being tamer there, and more numerous; whole flocks were driven into narrow defiles, where dozens might have been killed had there been more people with guns, lassos, or balls.*

Though the bed of the river is here so much below the level of the stratum of lava (from 1000 to 1200 feet), it still bears the appearance of having worn away its channel by the continual action of running water. The surface of the lava must be considered as the natural level of the country, since, when upon it, a plain extends in every direction.

How wonderful must that immense volcanic action have been which spread liquid lava over the surface of such an immense tract of country! Did the lava flow from the Cordillera of the Andes, or was it thrown out from craters in the low country?

The valley, or channel of the river, varies here from one mile, or less, to about three miles; but it *looks* narrower, owing to the deception caused by high land on each side.

Some of the views hereabouts are striking, and, from their locality, interesting; but I could not have believed that the banks of any large fresh-water river could have been so devoid of wood, or so unfrequented by man, beast, bird, or fish.

1*st May*.—The weather was invariably fine during the earlier part of our journey, but here it began to change. Two or three gloomy, clouded days, were succeeded by a few hours' small rain, and by strong wind.

This night we slept at the foot of heights whose summits were covered with snow, but the temperature was many degrees warmer than that of the first night, when it froze sharply. We had no particular frost after the 21st.

On the 2*nd* of May we had great difficulty with the boats, the river being contracted in width, without diminution of the body of water pouring down.

On the 3*rd*, we found a more open country; the lava-capped heights spread away on each side, leaving a vale of flat and apparently good land, many (probably from five to fifteen) miles in extent. The width of the river increased. On its banks were swampy spaces, covered with herbage. Low, earthy cliffs, without either shingle or lava, in some places bounded the river. A little further, however, the usual arid and stony plains of Patagonia were seen, extending from the banks of the river to ranges of hills about 1400 feet above its level, on which the horizontal lava-capping could distinctly be seen.

* Bolas of the Indians.

In the distant west, the snow-covered summits of the Andes stretched along the horizon. During three days we had advanced towards those far-distant mountains, seeing them at times very distinctly, yet this morning our distance seemed nearly as great as on the day we first saw them.

A long day's work carried us beyond the flat, and into the rising country, whose barrenness I have just now mentioned. All hands very tired.

4*th*.—Provisions being almost used, and the river as large as it was beyond the lava country—our time being out, and every one tired—I decided upon walking overland as far to the westward as we could go in *one* day, and setting out on our return to the Beagle on the following day.

I was the more inclined to this step, because the river made a turn to the southward, to follow which would have expended a day, without making any westing; and because I thought that some of our party might walk in a westerly direction, at least twice as far as they could track the boat. To have followed the course of the river two days longer would have required all the small remainder of our provisions, without enabling us to see further than we should be enabled to see by one day's walk *directly* westward.

Leaving those who were the most tired to take care of the boats, a party set out in light marching order. A large plain lay before us, over which shrubs, very small trees, and bushes, were sparingly scattered.

At noon we halted on a rising ground, made observations for time, latitude, and bearing, on a spot which we afterwards found to be only about sixty miles from the nearest water of the Pacific. The Cordillera of the Andes extended along the western side of our view. The weather was very clear, enabling us to discern the snow-covered mountains in the north, and almost in the south, so much of the great range was visible. But of the river we could see nothing. Only from the form of the land could we conclude that at the end of the southerly reach I have mentioned, the direction of the river is east and west for a few miles, and that then it turns to the northward, or rather comes from the northward, along the base of the Cordillera.

There are many reasons inducing one to suppose that it comes not only *from* the northward, but from a considerable distance to the northward. At the place where we ceased to ascend the stream the Santa Cruz river was almost as large as at the places where we passed the first and second nights, near the entrance. The velocity of the current was at least six knots an hour. The temperature of the water was forty-five degrees (of Fahrenheit), while that of the air was seldom so high in the daytime, and at

night was usually below the freezing point. Trees, or rather the trunks of trees, were found lying on the banks, whose water-worn appearance indicated that they had travelled far in running water. The water was very free from sediment, though of a whitish blue colour, which induces me to suppose that it has been produced by melting snow, or that it has passed through lakes in which the sediment it might have brought was deposited.

When one considers how large an extent of country there is between the river Negro and the straits of Magellan, and that through that extensive region only one river of magnitude flows, one must be at a loss to account for the manner in which the drainage of the eastern side of the great Cordillera is carried off, or how it disappears. The *river* Gallegos is *small*, though it runs into a large estuary. The Chupat is very small. That at Port Desire is a mere brook. At times, *once* in a year, those smaller rivers are flooded, but their floods seem unequal to carrying off the drainage of the Andes. *Only* the Santa Cruz flows with a full and strong stream throughout the whole year. Perhaps the sources of the Santa Cruz are not far from the sources of the southern branch of the river Negro, near the forty-fifth degree of latitude, and it runs southward, at the foot of the Andes, through several lakes, until it turns to the eastward in latitude fifty. If formed from the waters of the nearer mountains, its temperature would surely be lower, more nearly that of melted snow. It would probably bring much sediment, and would be more coloured. I do not think we explored above one-third of its course.

Reference to the accompanying plan will show our position when we decided to return. The level of the river at that place was found to be 400 feet higher than that of the sea at the entrance; and as the distance is about 200 miles, following the course of the river, the average descent or fall of the river must be near two feet in a mile, which, I apprehend, is unusually great. I could not think that the numbers were right, until after repeated examination. Two barometers were used at the river side, and a very good one was carefully watched on board the Beagle (at the level of the sea). Certainly the rapid descent of the river in many places was such, that even to the eye it appeared to be running down hill. This remark was often made in the course of our journey.

Two days before we reached our westernmost point, many traces of an old Indian encampment were seen; but, excepting at that place, and at the spot which we passed on the 22nd, no signs of inhabitants were anywhere found. Scarcity of pasture, and the badness of the ground for their horses' feet, must deter Indians from remaining in this vicinity. That they *frequently*

cross the river in travelling northward, or towards the south, is well known.

The quantities of bones heaped together, or scattered near the river, in so *many* places which we passed, excited doubts as to what had collected them. Whether do the guanacoes approach the river to drink, when they are dying?—or are the bones the remains of animals eaten by pumas, or by Indians?—or are they washed together by floods? Certainly they are *very* numerous *near* the banks of the river. I do not think that the guanaco is often allowed to die a natural death. Pumas are always on the lert to seize invalid stragglers from the herd. At night the guanacoes choose the clearest places for sleeping, and lie down together like sheep. In the day they avoid thickets and all such places as might shelter their ever-watchful enemy. Condors also, and fierce little wild cats, help to prevent too great an increase of this beautiful, inoffensive, and useful animal.

Late on the 4th we returned to our tents, thoroughly tired by a daily succession of hard work and long walks.

Early on the 5th we began the rapid descent. Sometimes the wind favoured, and we passed the land at the rate of ten knots an hour. Sometimes dangerous places obliged us to turn the boat's head to the stream, pull against it, and so drop down between the rocks. Though easy, the return was dangerous.

5th May.—Our first day's work, in returning, was eighty-five miles, a distance which had cost six days' hard labour in ascending.

6th.—Next day we made good about eighty-two miles; and on the 7th we reached the salt water.

Only one fish was taken,—which had been left on the bank. It was similar to a trout. Not more than half a dozen live fish were seen, and none could be caught, either with hooks or nets.

We were twenty days absent on this little expedition, yet saw perhaps as little that was generally interesting as could be seen in a land and water journey of 500 miles in any part of the world. Barren shingly plains, extensive fields, or districts of lava, a distant view of the Andes, numerous herds of guanacoes, a few ostriches and foxes, and a very rapid river, were the principal things seen by us which deserve remembrance.

XI.—*Memoir on the Origin, Progress, and Present State of the Surveys in India.* By Captain Thos. Best Jervis, E. I. C. Engineers, F.G.S. & A.S.

A summary and popular account of the origin, progress, and actual state of the surveys carrying on under the auspices of the Honourable East India Company, has doubtless been considered a desideratum by many who are interested in geographical discovery, more especially as the results have recently been brought before the public, and have naturally suggested some inquiries as to the methods pursued, and the degree of confidence to be placed in what has been thus submitted to its criticism. It would indeed be a dereliction on the part of any who should enter upon the task of explaining these matters, were he to omit to notice at the outset how singularly disinterested and munificent a part this great and influential public body has taken in undertakings which, whatever may be urged of other schemes, originated in no sordid or selfish policy, and may undeniably be said to have more of a national character than any other to which their attention has been called: nay, further, which apart from the immediate exigencies of the state, have been pre-eminently calculated to speak to the steady, straightforward, enlightened principles that mark both those that direct, and those that administer the executive government of our Eastern empire.

The earliest records of the India House bear abundant testimony to the fact of the constant and lively interest taken by the Directors in the improvement of the charts and navigation of the Indian seas. Repeated instructions were sent out year after year to the local governments, to cause individual talent to be put in requisition by every species of encouragement:—log-books, astronomical and written observations to be procured and sent home, and where the originals could not be obtained, tracings were directed to be accurately made, and forwarded for compilation and publication. The patronage so wisely extended by our most gracious and excellent sovereign, George the Third, to the improvement of geographical knowledge, was thus in spirit and in letter transferred to his people in every quarter of the globe, and the steady support which other navigators and travellers experienced at the hands of royalty, were equally evinced by those who watched over the destinies of India.

Although some valuable scattered notices both of the geography and the trigonometrical operations have appeared from time to time in the Transactions of the Royal Society and the Asiatic Society of Calcutta, as well as in Major Rennell's Memoirs, and voyages and travels of a still earlier date, very little, notwithstanding, of what has been recently accomplished has, as yet, been

described in any publication generally accessible to the community, in a simple and connected form, intelligible to readers of all classes. In endeavouring to supply this deficiency, it were much to be wished that such an epitome had been ready prepared to hand by those who have successively superintended these operations, and were, therefore, most competent to do justice both to the subject itself, and to the many meritorious individuals who have been engaged in its execution, the memorials of whose unobtrusive industry and talent would, but for such notice, be entirely forgotten and lost. In default of such account, the following particulars will be received with indulgence, and probably be found acceptable, inasmuch as they are drawn from the best sources of information by one who was for many years employed on that survey, and felt an enthusiastic interest in its progress and execution. I should have deemed it presumptuous to have engaged to prepare this paper for the Society, but for the conviction that the fulfilment of such an undertaking by any other person would perhaps have been attended with considerable difficulty, and the conclusions, so drawn, might after all have been judged far less satisfactory than as they now come from the pen of a soldier little used to description, though intimately conversant with the nature of the countries surveyed, the circumstances and capabilities of the parties employed, and the several methods which were used under all the discordant and conflicting emergencies, in despite of which so much has been accomplished.

It may be expected, however, that I should preface this account with a few remarks on the progress of geographical knowledge generally, as an appropriate introduction to that of Asia, and bring it down to the period when our acquisitions in British India began to assume an importance to the country, which demanded a more energetic exercise of authority, and established the East India Company in the administration of its government. An analysis of this sort is chiefly instructive as it illustrates the march of intelligence, and the advance of the arts, and perhaps as throwing some light on communications which have occasionally been received with interest by the Society respecting the early navigation of the ancients.

In taking a cursory review of the progress of the most interesting and important departments of knowledge, it seems difficult to account on any rational principles for those singular contemporaneous fits, those widely-diffused impulses which circumstances absolutely unconnected with each other concur to produce in the minds of individuals, directing and instigating them to occupations and researches in extension of the most valuable objects and pursuits which have engaged the attention of the civilized world. Neither is the question satisfied on the ordinary plea of necessity. Take what department you will, though necessity shall be clearly

shown to have been equally imperative, and the times proportionately fertile in expedients at the periods when such inquiries were instituted, there is a ripeness of season at which every project that is started, every effort in aid of individual sagacity or industry can alone be productive of fruit. Nor are the advances to such state, although unobserved, less subordinate to this remarkable principle. Like the return of suspended animation, the first symptoms of change are almost imperceptible, but at length the new accessions of vitality and strength are visibly increased, and the struggles of life go on with a marked and characteristic rapidity till the recovery is perfect. And it is thus, more probably, with that unnatural state of ignorance which has hitherto supervened for many ages, than to any progressive advance of the mind, whether intuitive or produced by external causes, that we should rightly apprehend the present strides of science. From a state of inanimation the moral and intellectual pulsation has been at first comparatively slow, and indistinctly perceived. The exhibition of every successive effort is a characteristic harbinger of higher and more rapid degrees of improvement,—an improvement which will eventually lead to every desirable approach to perfection.

Whatever may be the most rational account of this remarkable and simultaneous concurrence of events, many people are content to dismiss the difficulty, by referring it either to the particular occasions which call forth individual talent, or to the influence of certain master-spirits on the subsisting state and character of society. And doubtless it is on this showing, that War or Peace, Freedom or Servitude, commercial enterprise or despotic tyranny, are presumed by one or other of us to operate as so many spurs or checks to the further progress of the human race in the chief desiderata of Science and Art. Without going at any length into the proofs of this assertion, we might advert to the remarkable literary inquiries and establishments in the eighth and ninth centuries, instituted or fostered at one and the same period, in connexion with the religious persuasions of the Christians, the Mohammedans, and the Booddhists. The peculiar encouragement thus held out to the cultivation of the Latin by Charlemagne and his immediate successors in France and Germany; of the Arabic by the Khalifs Almunsoor, Haroun Alraschid, and Mamoon; and by the respective sovereigns of India, Thibet, and China, of the Sanskrit, Pali, and Thibetian languages;—these were eminent though unconscious precursors of those subsequent discoveries, to which we now recur with especial admiration.

Geographical science furnishes also another and appropriate illustration of this fact. The simultaneous exertions of many individuals wholly unknown to each other, to institute inquiries preparatory to that enlarged and more exact acquaintance with the

relative situation of countries and objects on the surface of the globe, its precise form, dimensions, distribution, and local peculiarities; these all have followed successively at intervals, as investigations supposed to have originated in fortuitous circumstances which some one or other of the foregoing causes had contributed to elicit or suppress. This view of the matter, however discursive it may be thought by such as are indisposed to general reflections, is of consideration chiefly, and indeed solely, as it shows us the position we actually occupy, while it presents us with a cheering and magnificent prospect of what is yet to be effected and anticipated in this most essential article of information.

The most striking feature of these investigations is sufficiently exemplified in the progress of geographical discovery from the fifteenth century, when the long dormant energies of the descendants of the Phœnicians, or the jealousy and rivalry of other nations prevailed with the Spaniards and the Portuguese to wrest the commerce of the East from the hands of the Venetians, or to strike out new and unexplored paths for industry, enterprise, and social intercourse, in subservience to the spread of what was usually held out to be the paramount design, the communication of religious truth. The great object of the Portuguese, in point of fact, may probably be referred to their anxiety to dispossess the Venetians of their important commercial advantages in Egypt. The memorable treaty of that people with the Mamelukes, and their arrangements to defend the desert against the Portuguese, sufficiently demonstrate the real spirit of the restrictions to the first navigation to India. The severe system of taxation imposed by Sultan Selim, who conquered Egypt in 1512, and the avarice of his successors, contributed also to engage the Portuguese to follow up the discovery of India by that of still more remote lands—for then only were the great commercial importance of their discoveries rightly understood.

Whatever may have been the amount of our acquaintance with Asiatic countries, and India in particular, previous to that time, it would serve us little to examine more particularly, excepting only as it affected the question of the maturity of science in past ages. That the intercourse of the ancients was more extensive, even with the remotest parts of Asia, than has been usually admitted by European writers, will unquestionably be agreed to on examination, and thus a multiplicity of customs, laws, and institutions be legitimately referred to a common origin, which on any other supposition are altogether inexplicable.

The Spaniards unexpectedly arriving at their destination by a much shorter route than the Portuguese, left the latter uninterruptedly to pursue the great design of reaching India by sailing easterly; and of the courage and boldness of the two nations, we

may be disposed, on mature reflection, to doubt whether the palm was not more justly due to the Portuguese. It was indeed a bold step, after having advanced so far to the south, to turn to the east, and realize in some sort the first move to the circumnavigation of the globe, since it was in fact almost on the very heels of the first adventures of the Portuguese that this great problem was solved by Sir Francis Drake* and Oliver Vander Woort. The voyages undertaken by the Spaniards and Dutch to the Spice Islands were likewise as stepping-stones to a greater achievement, the honour of which was reserved for our own country, just one hundred years after Bernal Diaz rounded the Cape.

And here it may be pardonable, in reference to the early commerce of the ancients, to advert, though briefly, to the singular advantages, in a geographical point of view, which the Jews possessed over every other nation of the earth, inasmuch as that remarkable people, being the chosen depositaries of institutions and laws preeminently superior in their moral and social tendency, they were thus in a manner encouraged and counselled to the fulfilment of higher objects in the designs of Providence, by the most extensive interchange of the commodities of their own for those of other distant lands. Palestine, as it were, the key to the commerce of the whole earth, was accessible to the shores of India, Arabia, and the eastern coast of Africa, by a branch of the Red Sea. By the Mediterranean its communications with the northern and western coasts of Africa, the eastern shores of Europe, and by no very hazardous route with the shores of America, were equally easy, while the Black Sea, the Caspian, and the Persian Gulf, presented facilities in other quarters which no other country could have boasted of. That the ancients had a knowledge of those countries, and that they had actually circumnavigated Africa, is as probable an inference, from the testimony of Herodotus, as that the intercourse with the East was familiar to the Jews so early as in the reign of Solomon, when they trafficked for ivory, apes and peacocks, since the latter are peculiar to the countries east of the Indus. The testimony of Herodotus to the circumnavigation of Africa by the Phœnicians is remarkable, and to many may appear as conclusive as curious. The authenticity of the passage indeed has, like many others of a similar description, been disputed by critics on account of the remark that "when autumn arrived they drew to shore on that part of Libya opposite to which they might be, sowed the grain, and awaited the harvest, which, when they had reaped, they again set sail; a conclusion, however, which, as well as that of the sun's rising on the right hand as they rounded the extreme promontory, and the resistance opposed to

* The motto given to Sir Francis Drake by Queen Elizabeth quaintly expressed his merits—"Tu primus circumdedisti me," surrounding a terrestrial globe.

their further progress by the contrary currents and accumulation of sea-weed in 14° S., mentioned at the termination of the narrative, all bespeak alike the fidelity of the historian and the veracity of his informants.*

These are considerations, however, which many may reckon more fanciful, or at best, more speculative than conclusive and useful. Let it be remembered, however, that one step made towards the solution of any difficulty is calculated to pave the way to the solution of others:—and while we dwell on the beauties of classic literature, we are frequently tempted to discredit the accuracy of the author on the ground of one mis-statement, or disparage his writings on the score of puerility or fiction. Thus also, when tracing similarity of moral institutions and civil usages in remote parts of the earth, where intercourse had not been suspected,

* "I wonder at those who divide and lay down the boundaries of Libya, Asia, and Europe, as if the difference between them were not very great; for, while in length, Europe extends along both, no comparison can be formed by which to estimate their relative width. Libya declares itself to be circumnavigable, except where it is bounded by Asia. The first person known to have proved this was Necho, King of Egypt. When he ceased to carry on the canal leading from the Nile to the Arabian Gulf, he sent out some Phœnicians, instructing them to sail round by the Pillars of Hercules (Straits of Gibraltar) to the Northern Sea (the Mediterranean), and so return to Egypt. These Phœnicians, therefore, parting from the Erythræan Sea, navigated the Southern Sea. When autumn arrived they drew to shore on that part of Libya opposite to which they might be; there they sowed the ground, and awaited the harvest, which, when they had reaped, they again set sail. Thus they continued their progress during two years; in the third, doubling the Pillars of Hercules, they arrived in Egypt. These persons affirmed, what to me seems incredible, though it may not to another, that, as they sailed round Libya, they had the sun (rising) on the right hand. In this way was Libya first made known.

" Long after the Phœnician voyage, as the Carthaginians relate, Satapses, son of Teapses, of the Achæmenidian family, was sent to circumnavigate Libya, though he failed to accomplish his task; for, appalled by the length and desolation of the voyage, he turned back without having achieved the toil imposed upon him by his mother. This Satapses had violently insulted a daughter of Zopyrus, son of Megabysus; for which offence he was about to be impaled by the order of King Xerxes, when his mother, who was the sister of Darius, interceded for him, saying that she would inflict upon her son a still greater punishment, for she would lay upon him the necessity of circumnavigating Libya, until he should arrive in the Arabian Gulf. Xerxes consented to this proposal, and Satapses going to Egypt, there hired a ship and mariners, and thence sailed through the Pillars of Hercules. Having passed these, and doubled the extreme point of Libya, which bears the name of Soloëis, he sailed southward; but after traversing, during many months, a vast extent of sea, and knowing that still more must be passed, he turned his course, and sailed back to Egypt. Thence he proceeded to Persia, and presented himself before Xerxes. He said, that on the remotest part of the coast along which he sailed he saw men of diminutive stature, clad in leaves of the palm tree, who, whenever the sailors drew to shore, abandoned their towns, and fled to the hills. His people entering, did the natives no other injury than taking their cattle. The reason why he could not sail entirely round Libya was, he said, that in attempting further progress his ship stuck fast; but Xerxes not giving credit to the excuse he made for not fulfilling the appointed task, condemned him to undergo his first sentence, and he was impaled. The chief officer of Satapses, instantly as he heard of his death, fled to Samos with great wealth. This treasure was seized by a certain Samian, whose name I well know, and purposely conceal."—*Herodotus*, Book iv., Section 3.

we are in a like degree prone to conclude against a degree of civilization and intercourse, which may be founded in reason as well as in fact, from not having sufficiently examined or considered the evidences to the contrary.

The commercial expeditions to India by the Romans, the Egyptians, and at a later period by the Arabs, were of too exclusive a nature to throw much light on geography; vestiges of the former on the coast of India are still to be found throughout Malabar, where large collections of Roman coins have escaped the furnace of the goldsmith.* The Egyptian fleets were encountered by the Portuguese on their first arrival in India, and the Arabs had for many centuries colonized not only on the whole line of coast from the Persian Gulf to Cape Comorin, but had established themselves on Ceylon, and all the principal islands of the Indian archipelago. In such state of things Europeans found the navigation when they first became acquainted with it; but for the successive improvements it has undergone from this period, we are much indebted to the diligence of persons unconnected with official duties.†

The circumnavigation of the globe was, however, too much to be taken on trust, and the relative situation of countries needed further confirmation. These were pursued with unabated curiosity, till in seeking to assign to objects their proper place on its surface, the precise form of the earth and its dimensions, new and still more intricate problems were found to be indispensably necessary. It is in this stage of the proceedings that we purpose to notice the most prominent particulars connected with the geography of Asia, more especially those departments of it which relate to India, and the valuable maritime surveys instituted and carried on by the public spirit and munificence of the Honour able East India Company.

The contemporaneous experiments of Picard in France, of Snellius in Holland, and Norwood in our own country, for the measurement of a degree on the meridian, had given rise to many curious speculations, which, in conjunction with the mathematical deductions of Huygens and Newton, revived in the early part of the eighteenth century the contested problem of the determination of the earth's ellipticity. In the researches incident to such inquiries, much new geographical matter had been added to that acquired from other sources, and every resulting formula so obtained was systematically applied by Cassini and Danville to the improvement of the charts and maps of other countries. They

* A very large and most valuable collection of these coins is now in the possession of a native at Palghautcherry; and Mr. Sparks, of the Madras civil service, told me he had been particularly successful in procuring many rare specimens in that province.

† Horsburgh, the self-taught cabin-boy, and one of the first hydrographers in the world, is an instance in point.

were indeed remarkably qualified to originate geographical projects, and reduce the stores of information which were daily flowing in from all quarters, and for a considerable period the maps of the latter as respects India and the neighbouring countries were the best we had. But a vast field had at length been gradually opening out for like investigations in India, as in Europe, by the extension of the theatre of war to the most distant and hitherto unexplored provinces, and the gradual subjugation of the princes lately confederated with the French nation. Major Rennell of the engineer corps, whose celebrity as a geographer is familiar to all of us, was the first person who reduced the miscellaneous materials collected by British officers on the same principles, and in pointedly stating his obligations to Mons. D'Apres' Neptune Orientale; and to M. Danville's maps of Asia and India, published in 1751 and 1752, he eulogises with astonishment the skill and tact with which that excellent geographer availed himself of the scattered notices derived from vague itineraries and books of travels.

This observation of Major Rennell, respecting Danville, may lead us to estimate the peculiar talent which enabled him also, under existing circumstances, to produce so much valuable information respecting countries that were inaccessible to European observation; it was the talent of comparing and collecting, the habit of selection, and a judicious application of such selection to one uniform system—requiring no ordinary share of patient investigation and deference to truth, to the exclusion of whatever might be either speculative or unknown. A memorandum or simple route enabled him under such restraints to fix the position of many interesting places with a very tolerable degree of precision. To everything there must be a beginning, and with reference to those who are disposed to undervalue labours of this sort, it may be well to offer in extenuation that the master hand is as frequently displayed in the first rude outline or design as in the finishing touches of a portrait; and a hasty sketch is, in its way, calculated to express frequently as much as can be conveyed by a more perfect delineation. With regard to Major Rennell's opinion, that the public records at Goa contained much that might have served to illustrate eastern geography generally, he was doubtless misinformed, as I had the most unlimited access to everything of that sort for several years, and was assured that if anything had been deposited in the archives prior to 1700, it had been abstracted or destroyed at the instance of the Marquis of Pombal.

Having once laid down a general plan, everything additional fell in its proper place, and served at least to recommend more perfect and accurate surveys to succeeding investigators. Such as his information was respecting Berar and Bengal, it is still the

most complete we possess, though the rewards and credits were in a measure bestowed on a far less gifted and successful observer, Colonel Charles Reynolds. There is one way, however, of satisfying those who are over-scrupulous, and can find no merit in adjustments so dependent, as they may argue, upon chance, which I will venture to affirm is unanswerable, and that is, a comparison of the latitudes and longitudes of the principal points determined by Rennell, and the results of the great trigonometrical survey. The coincidences indeed were more than sufficient to justify that remark made many years ago by Johnson, in his Tour to the Hebrides, that many parts of India were better known than the northern parts of Scotland.

Many very intelligent officers soon followed in the train of Major Rennell; Captain Moncrieff, of the Bombay Engineers, Captain Mackenzie, of the Madras Engineers, and Colonel Charles Reynolds, who were all three very early distinguished for their capacity in this line. The former, in his progress through Canara and Malabar, produced a valuable geographical sketch of those provinces subsequently incorporated by Colonel Reynolds in his large map of India.*

It is not too much to conclude that some portion of the characteristic spirit of Rennell had been communicated to all those who were placed in connexion with him in his official capacity of surveyor-general; for about the time of the publication of his Memoir of a Map of Hindoostan, a variety of documents were placed on record, which were suffered to pass unnoticed, and there is still much in them which would deserve preservation. On the 14th January, 1780, Mr. Charles Chapman was deputed to the government at Cochin China, to inquire into the advantages of a commerce with that country, and to endeavour to establish a freedom of trade to all the Company's settlements, under sanction of the ruling power of the place. A narrative of his proceedings and observations on Cochin China and Tonquin, in pursuance of this mission, was forwarded to the Court. Another document, with a set of drawings of lands as they appear in the eastern passage to China, according to the bearings laid down, was sent in by Mr. George Grey Townshend, on the 24th January, 1791; and a further description, with charts of Cochin China, by Mr. George Taswell, on the 9th August, 1799. Lieutenant-Colonel Kyd, of the Bengal Engineers, Mr. Ritchie, Colonel Colebrooke, and Captain Blair,

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* Captain Reynolds' Survey of Bednore, on a larger scale than any which had then been attempted (four miles to an inch) first brought him into public notice, and deservedly so, both from the minuteness and accuracy with which it was executed, and its extent and completeness, considering how very few there were at that time who paid any attention to science.

furnished at intervals various astronomical particulars, and written information respecting the Ganges and the Hoogly rivers, as did Lieutenant Wood, Mr. Reuben Burrows, and Mr. Michael Topping, on the coasts of Arracan, the Delta of the Ganges, and the latter of the entire eastern coast, from the embouchure of that river to Cape Comorin. The volume of astronomical observations by Mr. Reuben Burrows, 31st January, 1791, may probably contain many well-determined points which have not yet been ascertained either by Captains Ross, Crawford, or Grant. They are accompanied at least by sketches of the coast, done with much care, and referred to a series of bearings, latitudes, and longitudes, which is to be inferred from the fact, that the entire book is throughout in the hand-writing of that skilful mathematician.

Mr. Michael Topping's observations on the currents in the bay of Bengal, of the 1st March, 1788, on the 16th January, and 26th June, 1792, may probably be found of essential importance in future investigations respecting the retreat or advance of the sea on the east coast of India, and the exact registration of the tides. His survey of the mouths of the Godavery river and Coringa road, 18th September, 1790, and 21st January, 1791, and his proceedings and report in the Masulipatam Circar, drawn up with a view to ascertain the practicability of applying the waters of the rivers Krishna and Godavery to the fertilization of the land, with charts, observations, and levels, communicated 20th February, 1794, and 2nd October, 1795, may yet induce the Madras government and authorities at home to reconsider that valuable project.

I have drawn up this summary account of a few of the most remarkable attempts to add to our stores of geographical and hydrographical information before the conquest of Mysore, during which interval the office of surveyor-general had been held successively by Colonels Call, Charles Reynolds, and Colebrook. I should not omit, however, to notice the valuable maritime surveys of Captains Huddart and M'Cluer, and Lieutenants Ringrose, Wedgeborough, and Skinner, on the western coast of India, from 1790 to 1793, which still continue to be good authority to navigators of that coast, and were actually incorporated by Colonel Reynolds in his map. At the time they were delivered to the government an outcry was raised against their accuracy, which subsequent inquiry has shown to be without a shadow of justice; and I may mention it as a corroborative proof of the attention and skill which must have been bestowed on the subject by Captain M'Cluer, that in carrying on a trigonometrical and topographical survey of the coast upwards, with all the helps and improved methods for which our recent acquisition of the country afforded also greater facilities, I found the actual outlines of the coast and exact distances differ very immaterially from those in

M'Cluer's charts, and I had the more favourable opportunity of verifying the fact, as the superintendent of marine furnished me with Captain M'Cluer's original drafts, on a large scale, for this express purpose.

Such was the state of our acquaintance with India down to the breaking out of the second war in Mysore in 1799, established for the most part on the valuable deductions of Major Rennell and Danville, whose labours were eventually incorporated with a mass of native information of indifferent character in the large map of Colonel Charles Reynolds. And here it may be well to pause for a while, and take a general review of the state of geography in India as compared with that of our own country, where many of us would willingly believe some much more marked advance had been made to an accurate acquaintance with the position and superficial extent of the British territories, than in less civilized lands; and that a maritime nation at least, such as England, had been long in possession of the most accurate charts of its own shores, which should enable its shipping, in the event of anticipated peril or stress of weather, to avail themselves of every advantage presented by peculiar natural localities.

In countries where the inhabitants are comparatively backward in point of civilization, where there are but few large towns, where commerce is not the primary pursuit, and there are hardly any great roads, the delineation of the great features which they present has usually been deferred till they have become the theatre of war, and even then are supposed for all ordinary purposes sufficiently complete by the collation of routes, corrected here and there by observations for latitude and longitude. It is argued that the difficulties to be surmounted, and the advantages to be expected, could never be commensurate with each other, nor would the expense of money and life thus bestowed be in any adequate degree compensated by the information acquired. Where so much is necessarily left to imagination, it is inconceivable how little dependence is to be placed on the generality of such compilations, how much interpolation and repetition also of rivers and towns, and other principal objects, are incident to the mere inconsistencies of orthography. My particular attention was drawn to the latter circumstance, on going over the tract of country on the western coast of India, and comparing the actual survey with that compiled by Colonel Charles Reynolds in 1798.

Moreover, as in route surveys much is left to the eye, to the judgment of the observer in estimating distances, as well as to his candour in drawing inferences from the various descriptions of information presented to him, it very rarely happens that any two practitioners, and they are usually self-taught amateurs, arrive at the same conclusions. The very same provinces, therefore, whic

purport to have been laid down from the most accurate observations of such persons have occasionally a degree of dissimilarity to each other, which leaves the compiler quite at a loss on what principle to reconcile their discrepancies. The repetition of such surveys serves only to increase perplexity, where some even of the principal towns and geographical features are most unceremoniously shifted several miles, while their exact position is still matter of doubt, if happily he should not find them in two places wide apart.

Such, anterior to the commencement of the great trigonometrical survey in Great Britain, was the only method in general use, and it will not be out of place to mention that there were then errors in the positions of some important points, as the Lizard, to the amount of seven minutes of a degree, and that many of the best county maps exhibited blunders of three miles in a distance of less than twenty.

The various surveys throughout India and in Bengal, to a still later date, have, with few exceptions, been conducted in like manner, and the maps of districts under the latter presidency have, in consequence, been proportionally erroneous. To remedy this defect has long been desired, but it is a task not easy at first sight to determine how a measure fraught with so many difficulties is to be effected without an extravagant outlay of money.

The great map of India constructed by Colonel Reynolds was formed also on the foregoing principle. One extensive line of route running through several degrees of latitude from Goojerat to Hindoostan, and corrected where it terminated on either side by observations of latitude, having been measured with considerable care, constituted a primary basis, to which other routes diverging on either hand were referred, and the intermediate spaces filled in from native information, or the labours of his assistants, Colonel Monier Williams, Sir James Sutherland, and other officers. This was until very lately the foundation of the entire map of Cutch, Kattywar, Goojerat, Hindoostan, and Rajpoothana, corrected at times by route measurements under his successor Colonel Monier Williams. The expense of this imperfect geography from first to last has been incredibly great, but the reputation of Colonel Reynolds' system and of his successors in office stood so high with the Bombay government, that every suggestion for improved and more conclusive surveys was invariably negatived as superfluous.

A collection of routes and other information collected by Colonel Kelly, and suggestions for the improvement of the south of India, by Lieutenant-Colonel Gent, chief engineer at Madras, on the 28th January, 1784, followed up by a large and valuable compilation of routes by Captain Mackenzie, during a period of twelve years, four of which were incessantly devoted to that duty

constituted the basis of the geography of the south of India, lying principally between the Krishna river and Cape Comorin. Captain Mackenzie's labours began towards the close of the war of 1783, in the provinces of Coimbatoor and of Dindigul, afterwards in the course of his professional duties as an engineer in the provinces of Madras, Nellore, and Guntoor, throughout the whole of the war from 1790 to 1792 in Mysore, and in the countries ceded to the Nizam by the peace of 1792, from which period till 1799 he was engaged in the first attempts to methodize and embody the geography of that prince's territories and the Deckan, interrupted only for a short period by the voyage and campaign to Ceylon in 1795-6. The peculiar talents of Captain Mackenzie for geographical and statistical inquiries had been early brought to the notice of Lord Cornwallis, and his deputation to the Nizam's dominions, at the conclusion of the campaign of 1792, enabled him to reduce the materials for the map of that prince's territories to some degree of order. This map with the routes, memorandums, and notes, constituted the most useful exemplar of military survey, and contains, besides actual measurements, a multiplicity of curious and useful remarks on every subject that fell within his reach.

But a new and important era was now opening on this department of knowledge throughout the civilized world. The defectiveness of the best British maps, the revolutionary turn of affairs in France, and an accidental circumstance of the most unlooked-for nature led in each of these countries to the entire remodelling of the respective surveys.

The British government having deputed Lord Macartney on an embassy to the Emperor of China, charged their ambassador with various magnificent presents, and amongst others some which perhaps even our modern intellectual diplomatists would consider a little out of character, a beautiful zenith sector and 100-feet steel chain, constructed by Ramsden, a levelling and transit instrument, besides other apparatus of a like costly and scientific description. The Emperor having declined this conciliatory offering, the embassy stopped at Madras on its return homewards, and on coming to a reckoning with Dr. Dinwiddie, the astronomer and physician who had accompanied Lord Macartney, the luckless instruments were assigned to him in part payment of his salary. The mathematical abilities and philosophical turn of mind of Colonel Lambton, at that time a lieutenant in H. M. 33rd regiment, had not escaped the observation of its distinguished commandant, the Honourable Colonel Wellesley. Lieutenant Lambton, who was at that time officiating as brigade-major to Sir David Baird, having accidentally become acquainted with the circumstance, and confident of his own powers, made interest

that these valuable instruments should be rescued from the auctioneer, and turned to some national account. The Earl of Mornington, the governor-general, on the final reduction of Mysore in 1799, being then at Madras, concurring with his brother in the advantageous opportunity thus presented for carrying on an extensive survey of the Mysore dominions, further nominated Captain Mackenzie to the topographical details, while the statistics were assigned to Dr. Buchanan.

Events had thus fortunately concurred to the furtherance of the design proposed by Lieutenant Lambton, and humble as this tribute may appear, it is no less just than due to ascribe the first encouragement of the measurement of the largest meridional arc that has ever yet been undertaken throughout the world to his Grace the Duke of Wellington. Every one who has experienced the difficulty of maturing any useful project, can better appreciate the patience and foresight which could have led his Grace to recommend Lieutenant Lambton's novel scheme to the government of India, prepossessed, as it had hitherto always been, in favour of the sufficient accuracy of mere geographical and route surveys.

At his Grace's suggestion to Lord Mornington, Mr. Petrie and Lord Clive, then Governor of Madras, the instruments were purchased on account of Government, and in furtherance of this project, a large theodolite similarly constructed to that used by General Roy, as also an altitude and azimuth circle for secondary triangles were made in England by Cary, and by the year 1801 all the requisite apparatus was at Lieutenant Lambton's disposal.*

In the year 1800 a plan of the intended operations was submitted to the government of Fort St. George, and with their sanction published in the seventh volume of the Asiatic Researches. It was here proposed to join the coasts of Malabar and Coromandel by a series of triangles, which might be extended on the south to the extremity of the peninsula, and to an indefinite distance on the north, on a plan similar to that which had lately been adopted in France and England. In the month of October of that year, a base line was measured near Bangalore, and the first experiments were made with the zenith sector at Dodagoontah. In the early part of 1802 a base line was measured near Madras, and in the mean time a new chain had been received from Mr. Ramsden, which professed to have been laid off at the temperature of 50° Fahrenheit from that artist's bar.

Lieutenant Lambton's first operations after this, were to carry on a series of triangles depending on the Madras base westward, to meet the Bangalore base, and finally the west coast near Man-

* Much of the excellence of these operations has been attributed to the skill of the artists Ramsden and Cary in the apparatus employed, and it is not out of place therefore to bring such high testimony before the public in the Society's Memoirs.

galore. In pursuance of this intention, he established the meridians of Carangooly, Kylasgurh, Terrakondah, Severndroog, Mullapannabetta, and Balroyndroog, the positions of each of which he determined with relation to the Madras observatory. He also essayed to measure two perpendicular arcs, viz., those connecting Severndroog with Yerracondah on the east, and Mullapannabetta on the west side, each being nearly sixty-seven miles in length.

No country or circumstances could have been more favourable for such an attempt, whether we regard the skill, intelligence, and zeal of the operator, the excellence of his instruments, the liberality and freedom from restraint which he experienced on the part of the Government, or the fortunate situation of the eminences on which his stations were chosen. But it was his opinion that he had failed entirely in deriving any results to be depended on from his perpendicular arcs; and it is now, I believe, the general opinion among mathematicians that longitudes cannot be determined by this method, but must be deduced from other sources.

About the same period Lieutenant Lambton carried a series to the southward, which terminated at a place called Trivandapooram, near Cuddalore. Here he determined the latitude by a sufficient number of zenith distances, and he then proceeded to Paudre, a place nearly under the same meridian, where, by another set of zenith distances, he found the amplitude of the celestial arcs between the north and south points of a small meridional series, in middle latitude 12° 32′ 21″. This arc forming no part of the principal meridional series, which passes through Dodagoontah, was subsequently carried by him to the southward down to Punnae, near Cape Comorin, and finally to the northward as far as the parallel of 21° nearly; but as the particulars of these operations are all in the possession of the Court of Directors, it would be superfluous to enter into any description of them in this Memoir. The meridians of Severndroog and Dodagoontah are so near to each other, that the same series connects both: for geographical purposes, such as the determination of latitudes and longitudes, the former is used, the latter only being reserved for scientific details.

The measurement of a base of verification, and the observation of a set of zenith distances near Beder, in the year 1815, by Lieutenant-Colonel Lambton, brought the great meridional series up to the parallel of 18° 4′, and with it, of course, the series of Severndroog. In 1817 this series was continued to the northward to the Godavery river, the triangles then branched off to the eastward to meet the Yerrakondah meridian, down which a series was carried to the former points on the Krishna. In 1819

Colonel Lambton determined to bring up the series of Carangooly to the same parallel with those of Yerrakondah and Severndroog; but as the operations proceeded the features of the country seemed favourable for completing the intermediate series of Kylasgurh also, and by the end of 1820 both these series were satisfactorily conducted to the Godavery, though, it must be observed, that the unhealthiness of the tracts was such as to occasion great loss of lives, and to ruin the constitutions of almost all engaged in the laborious task. In the two following years the meridional arc was extended to Ellichpoor, and a base of verification measured in the valley of Berar by Colonel Lambton in person: the lateral series connecting Bombay with the base line at Daumergiddah, in latitude 18° 3′, was temporarily interrupted by the death of this distinguished officer on the 20th of January, 1823. From that period the operations have devolved on Major Everest, F.R.S., whose conjoint labours with Colonel Lambton have been brought before the public in a separate publication. Major Everest has subsequently carried on the meridional arc from Seronj, in latitude 24° 7′, to Kedar Kanta, in the Himalaya mountains, in latitude 31° 2′, verified by a base line in the Deyra Doon, situated near the foot of those mountains.

A lateral series connecting Calcutta and Benares with the great meridional arc at Seronj, by Mr. Oliver, and another series from Bombay, by Lieutenant Shortrede, has established the relative positions of the three principal stations in India.

A series of triangles by Captains Ward, Conner, Garling, Snell, and Jervis, has been carried on in the different provinces south of the 20th degree of latitude; and other lateral series, on four distinct meridians, are in progress to the eastward of the meridional arc, by Lieutenants Wilcox, Boileau, Macdonald, Waugh, and Renny.

I have purposely abstained from any observations on the continuation of the operations by Major Everest, as they will probably be given to the public by himself at no distant period, but consider it a theme of pride to our country to have had two so highly distinguished and competent mathematicians as Colonel Lambton and Major Everest, and that the latter should have lived to have brought to a completion the most extensive, and probably, I may venture to add, also the most accurate measure of the earth that has yet been accomplished. Punnae, the southern extreme, is in latitude 8° 9′ 38″; Kedar Kanta in 31° 2′. The total arc, therefore, is about one-sixteenth of the entire circumference.

On this triangulation as a basis, and on the various lateral series carried on by the officers and élèves of the excellent military institution established at the suggestion of Colonel Colin Mackenzie, of the Madras Engineers, and ably superintended for

many years by Captain Troyer, the whole of the peninsula south of the Krishna has been minutely surveyed in detail. The whole of the Bombay Presidency, Khandesh and the eastern portions of Goojerat only excepted, remain unfinished. Of the Nizam's or Hyderabad territories a large portion has been accurately surveyed. The Rajah of Berars, or Nagpoor dominions, have also been triangulated and surveyed, though with less attention to accuracy. The survey of the Northern Circars by Lieutenants Sackville, Buxton, and Snell, completes the portion designated as the Peninsula. North of this, of which the Nurbudda is the boundary, a very large portion under the Bengal Presidency has been likewise surveyed, according to the methods already adverted to, that is, route surveys corrected by astronomical observations; and on the eastern frontier much geographical matter has been added by Lieutenants Wilcox, Pemberton, and Grant.

But we reserve the more complete and exact details, both of these surveys and of the still more important and valuable surveys conducted by the officers of the Indian Navy, to a future opportunity.

[*To be concluded.*]

XII.—*Notice of the Mountain Aconcagua in Chilè.* By Captain Robert Fitz Roy, Royal Navy.

During the Beagle's survey of the Chilian coast, it was ascertained that the mountain Aconcagua was higher than the famed Chimborazo. By the mean of the results of many observations made by the Beagle's officers at different stations on the coast of Chile, near Valparaiso, the height of Aconcagua above the sea appears to be 23,200 feet. Of various observations made at different times, no one result was less than 23,000, nor more than 23,400 feet.

According to recent accounts, the highest mountains in South America are—

Sorata, whose height is said to be	25,400 feet
Illimani, said to be	24,200 „
Next to which Aconcagua claims a place, as .	23,200 „
Gualtieri is said to be	22,000 „
And Chimborazo	21,000 „
above the level of the ocean.	

Amongst a variety of data for calculating the height of Aconcagua, the following are considered the best:—

Observation made at Fort San Antonio, Valparaiso, with a good theodolite, forty feet above the level of the sea at half tide. Angular elevation of the highest point of Aconcagua above the

horizontal plane 1° 55′ 45″. The true bearing of the same point was N. 74° 56′ E., and the distance 89,3 miles (of 60 to a degree). Fort San Antonio, Valparaiso, is considered to be in lat. 33° 1′ 53″ S. and long. 71° 41′ 15″ W. of Greenwich.

Captain Beechey has since made observations for ascertaining the height of Aconcagua, and their result is greater than that of the Beagle's by some hundred feet.

Aconcagua is a volcano in the Cordillera of the Andes; at intervals it is active.

XIII.—*Extracts from the Correspondence of the late Mr. Davidson, during his residence in Morocco; with an Account of his further progress in the Desert.**

The much lamented close of Mr. Davidson's life, an event which every member of the Geographical Society will unite in deploring, has made it the melancholy duty of that body to preserve some record of his latest exertions in pursuit of geographical knowledge. For that purpose his various friends and correspondents were requested to place in the hands of the Secretary such of his letters as contained any observations of moment; to this request they readily acceded, and the acknowledgments of the Society are more particularly due to His Royal Highness the Duke of Sussex, to whose gracious encouragement Mr. Davidson was mainly indebted for his favourable reception in Morocco, and who, with his wonted liberality, has allowed the transcription of the most interesting communications received from that enterprising traveller. To the extracts from Mr. Davidson's own letters, are added such accounts as have been at different times forwarded respecting his further progress and the fatal termination of his journey, the particulars of which are still involved in some doubt, though concerning the main point, the loss of his valuable life, there is unhappily no place for hope.

It would have been highly gratifying had it been possible to introduce these extracts to the reader, by a detailed memoir of Mr. Davidson's extensive travels in every quarter of the globe; but the materials furnished by such various and remote journeys could not have been collected and arranged in the short period which has elapsed since the sad intelligence of his end has been authenticated. Those journeys were also performed before their author was in correspondence with this Society, and for that reason are not necessarily connected with its Journal. His instructive lecture on the site of Jerusalem and the movements of the investing armies, the manuscript of which, had it received its

* For the notes at the foot of the page, the Foreign Secretary is answerable.

author's last corrections, would have formed a suitable counterpart to his description of a mummy which he opened and described after his return from Egypt, might have been inserted in this collection, had it not been too closely confined to topography and history to be properly placed among geographical disquisitions.

In the summer of 1835, Mr. Davidson, whose ardour was not checked by the many hazards and difficulties he had already experienced, formed the adventurous project of a journey into the heart of Africa, by what may be termed the most direct route. He therefore embarked in September, 1835, for Gibraltar, on his way to Morocco, from which country he hoped to reach Tombuktú by the route of Tâfilêlt, the road by which Réné Caillé travelled from that city northwards. To the almost insurmountable obstacles which would meet him at every step, Mr. Davidson was no stranger. His personal courage, however, his power of enduring fatigue and change of climate, readiness at finding expedients to obviate difficulties, and, above all, his peculiar urbanity, which could not fail to prepossess even strangers in his favour, gave his friends, and still more perhaps himself, a confidence which even those excellent qualifications could hardly justify. To many other accomplishments particularly valuable in such an undertaking he added a considerable knowledge of medicine, to which, indeed, he was in the main indebted for the accomplishment of that part of his journey which he did execute; and should his papers have escaped the notice of the savages who assassinated him, they may hereafter add another leaf to the laurels with which his brow is already graced.

The only person by whom Mr. Davidson was accompanied was a negro baptized in the West Indies by the appellation of Edward Donnelan, but better known in this country by his Muselmán name of Abú Bekr, of whom some account has been given in this Journal.* He is occasionally mentioned in the following letters by the name of Abou, and should he not have sunk under the privations and fatigues of the desert, may possibly hereafter supply us with a more authentic account of his lamented employer's end than any which we have hitherto received.

Mr. Davidson, as was before remarked, was well aware of the difficulties which awaited him, and at Gibraltar, where he was detained nearly three months, by the impossibility of clearing his way into the empire of Morocco, he met Mr. Hay, His Britannic Majesty's Consul-General in Barbary, who "seems to think" (he says in a letter to Dr. Lee, dated 13th September, 1835) "that we shall not be able to get on." His resolution was not so easily to be shaken; he proceeded to Tangier,† and after waiting there a

* Vol. vi. p. 102.

† Tanjah.

considerable time, had at length the satisfaction of informing his brother, Mr. T. Davidson, on the 13th December, that he had "that morning received a most kind and flattering letter from the Sultan of Morocco, accompanied by a few lines from his minister," commanding him to repair to the court, where he should experience nothing but what would be agreeable to him. This letter was accompanied by another to "El' Arbi Essaidi, the kaïd of Tangier, directing him to provide everything for his safe conduct, and inclosing letters to all the governors by whom he had to pass, that they should pay him respect, honour, and hospitality, inasmuch as he was travelling to benefit his fellow-creatures; that the governor [al-káïd] should provide him a guard of ten horsemen, commanded by a káïd [captain], who would enforce respect and ensure the due performance of the Sultan, their master's orders, which were that he should be treated with respect and consideration; and that his Majesty inclosed for him, the governor [of Tanjah], money for the soldiers, and extra pay for the káïd, who were to act under his orders, and be guided by his discretion." "Such," he adds, "is the manner, after a delay of three months, that I commence my arduous undertaking. I almost fear it is of too flattering a character, but must only use the more discretion."

Antecedently to the receipt of these gracious orders from the Sultán, Mr. Davidson's residence at Tanjah had not been either agreeable or encouraging, as appears from the following extract from a letter to Dr. Lee, written (10th December) only three days before the last:—"My good and grateful companion [Abú Bekr] begs me to forward the few lines he has this morning written to you, and I wish I could send you any particulars as to our journey, or any new observations on the small portion of this country which we have seen. With the exception of two or three excursions, [at] the utmost under fifty miles, I have been confined to the walls of this place, waiting the Sultan's permission to proceed into the interior. The jealousy of this people exceeds all belief; their insults [are] innumerable, and I fear their determination is not to allow us to proceed. I have, however, by means of a few presents, bought the interest of the governor of this place and of Tetuan, and have been allowed to visit the places in the neighbourhood, but never without a soldier, from whose view I cannot proceed one step. I have examined some of the neighbouring mountains, most rich in iron, and specimens of jasper and large masses of fossils. I have also passed some hours at the various douars,* or Arab encampments, have taken measurements of the ruins of the Outset,† or Pharaoh's Peg, as it is called; some

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* Adwár, plural of dar, a circular tent.

† Autád, plural of Watad, a peg or stake. Autád is corruptly pronounced U'tséd or U'tsét.

observations on which I hope shortly to send to England. I propose next week, should I not receive my permission to proceed south, [to] go from hence to the Djvarretts, amongst whose hills are some Bedouins. One large tribe, who used to escort the hadjis from this to Mecca, still remain in the neighbourhood; and I think some of them would for a good consideration take me to Mourzouk, from whence I could get upon the caravan-track for Soudan. I have had some conversation with the Sheïk of Wadnoon * here, on his return from Mecca; but he states he cannot take me through Morocco, but will protect me, should I get to his dominions. The second rains have commenced with more than usual violence, and part of the country is impassable, which may account in some degree for [my] not receiving my answer from Morocco. I shall lose no time as soon as I receive this, nor shall I delay more than this month, and if this fail, I shall commence the year by a new route. My health, thank God, is very good; but I am sorry to say that Abou has had his sight much affected; and I fear he is very unequal to the journey. I am taking every care of him by nursing him; and he is, too, I grieve to say, an object of great suspicion."

Secure under such a protection, Mr. Davidson lost no time in proceeding to the capital, and had the satisfaction of giving his brother an account of his progress in the following letter:—

"*The Garden of Mulai Moussa,*
Morocco, 18*th Jan.* 1836.

"My dear Brother,—I fear from what has accidentally transpired, that it is the Emperor's intention to detain me here for some time. I have little cause for regret, this not being the season for me to cross the chain of Atlas, and any hurry on my part would only lead to suspicion, which might prove highly injurious to my projects. According to the Sultan's directions, I started from Tangier with my caid [káïd, or captain] and his ten soldiers, accompanied, [for] the first two hours, by thirty of the consular corps: the good wishes of all, I believe, I possess—Mr. John Hay, the Consul's son, and M. Crusentolphe, the Swedish Vice-Consul, accompanying me on to Rabat,†—eight days' journey. I found much benefit, and derived great pleasure from the company of these gentlemen, the former of whom is a perfect master of Arabic. I have been also most fortunate in procuring an excellent dragoman,‡ who holds the office of interpreter to the British Consulate at Tetuan, and who has obtained three months' leave of

* Wádí Nún, or Núl, the valley or river of Noon or Nool.
† Rabát, *i.e.* Resting-place, Caravan-seraï; but here the name of a town.—F. S.
‡ Terjumán, or Tarjumán, interpreter, a word of the same origin as the Chaldee, 'Targum.'

absence, and is now my paid servant. He has twice attended the English medical men who have been sent for to attend the Sultan, with whom he is a great favourite. To Rabat, the country presents little worthy of observation; a fine fertile plain, rich valleys, with numerous streams, and a succession of mountain ranges reaching as far as the eye will carry one. A little circumstance had nearly deprived me of the great source of safety, and the main stay on which I have to rely. Crossing an arm of the sea, at the Coubba of Mulai Ben Absolam,* my mules got into a quicksand, and I was obliged to dismount my soldiers, who had to wade the ford, their horses accompanying the baggage, the ropes being passed round the mules' necks and haunches to draw them out. Most of my clothes [were] spoiled, and many of my little luxuries destroyed. Our weather, fortunately, was fine, and this induced us to stop and dry our clothes, which keeping us too late to reach our place appointed for encampment, we sent on the Sultan's letter to have a mona and house prepared at Mehidia.† The man mistook the road; and on our arrival, the Governor refused to give anything to either the soldiers, muleteers, or the animals. He had been told all his directions were in the letter, and his only verbal orders were to pay me every respect and hospitality. He took me and my party out to his gardens, got ready a part of his house, provided most amply for the three and my servants, but left both men and beasts starving, they not having had any food, this being Ramadan, for eighteen hours. Starting me in the morning, he gave me an additional escort of thirty men, to take me to Sallee,‡ opposite to Rabat. Arrived there, we were again without our letter; but the Emperor's son had sent orders about me. I had to make some disturbance here; was detained two days, to wait for an escort of 200 horse, to be relieved by other 200, owing to an insurrection which has just broken out amongst the Zaire, who, it appears, expecting I was coming richly laden, had determined to take me. They had plundered all the parties who had, for the last three days, passed their district. My letter arriving, the Governor altered his tone towards me. I had refused to pay him a second visit, because I was not treated with sufficient respect, and informed him I should appeal to the Sultan on my arrival at this place [Morocco]. He now comes to say my guard is ready, and he intends to accompany me the first two hours, when the Lieutenant-Governor is to take me on to the Commander of the Forces, who is posted at midway between this and the Douar at which I am to sleep. This sight was most beautiful: the variety

* The Kubbah (sepulchral chapel) of a saint named Múláï (Doctor) Ibn 'Abd-es-salám.

† Mehedíyah (the city of Mehed). ‡ Salá.

of dress and arms, the beauty of the Bast horse, and the meeting of sixty of the Oudaia*, who, added to my first escort, swelled our party to above 300. We had a slight *row* on the road, [and] took one man, which had nearly set the escort at war. The poor fellow claimed the protection of the Oudaia by a sign which they must acknowledge, and these, with some of their comrades amongst the party who accompanied me from Rabat, separating from the main body, prepared their guns for action. I had some difficulty, with the assistance of my caid, who appealed to their conduct before the person they had to escort. One man [was] severely wounded, and many [were the] losses of turbans, caps, &c. At our halt, having been joined by a large caravan on the road, we covered a considerable space.

"I encamped in the centre: my marquee, my caid's tent, two tents for my soldiers; Hassan, a sort of consular agent, going to Mazagan, with a little black tent between mine and the caid's; our muleteers in the rear; our horses and mules in a circle, and surrounded by about sixty soldiers: outside of this, the camels and the rest of the party [were] disturbed in the night by a large wolf, who had prowled in amongst us. Of these and the wild boar [there are] many traces. [We were] off early, and at eleven experienced a hurricane, which obliged us all to stop. Our animals [were] unable to face it, and we obliged for safety to dismount. Here our guard left us. All drenched to the skin, [we] proceeded to Dar-el-Beida,† and had no sooner got our tents up, than I received a message from Mulai Abdrahman,‡ the Emperor's second son, to say he had prepared a place for me in the court of the palace, and that it was too dangerous to sleep outside the walls. I went, praying to be excused the fatigue of striking the tents uselessly.

"On entering the town I was received by his guard, who galloping close to me, fired their guns so near my face that I was nearly blinded. [The Prince is] a poor, puny boy, but having a very intelligent, wary Mentor. He had the orders of his father to bid me welcome. From this to Azamor,§ on the Oomer Begh,‖ where I met with the best of all receptions, the Governor accompanied me to Morocco with sixty horse. We ascended the three steps to the plain of Morocco. On the last night, at a place called Swynia, I was robbed of your gold watch and part of Abou's clothes. They have since been returned. On crossing a kantarah¶ over the Tensift, I was met by a party of soldiers commanded by a caid, to bid me welcome in the Emperor's name, his Majesty being out reviewing his cavalry. They were to conduct me to the

* Wedáyá (valley-men). † Dár el beïdá, the white house.
‡ Múlaï Abd-er-rahmán, Duke or Prince Abd-er-rahmán. § Azamúr.
‖ Umm-er-rabí', *i. e.*, the mother of spring. ¶ Kantarah, *i. e.*, bridge.

ruins I now inhabit. I was taken round the walls by Haba, the place of the lepers, who have not the privilege of entering the city. This added above six miles to my already long journey. I found this place greatly in ruins: it must have been splendid. My room, which is bed-room and parlour and all, is thirty-eight feet long, eighteen wide, twenty-six high, richly ornamented, but without the slightest article of furniture. This forms one room of a square, the other parts [being] occupied by my servants, the caid, his soldiers, &c. And I have this day an accession of fifty persons, with the Emperor's father-in-law, who has come to pay his respects, this being the season of the feast after Ramadan.* The old Moor, Seedy Mulai Ben Alee Abdrahman, has paid me a visit, and has become a patient. This evening I had to see his ladies, all fancying they were ill, [and eager] to see the Christian after two days' quiet (as they call it), that is, not travelling. I was ordered to be in readiness as soon as it became dark, to go and see the Minister. A person would come for me, and I was to put on a cloak, and follow with my dragoman. At seven, an old Moor, with two soldiers carrying lanthorns, came for me: I was surrounded, as soon as I was out of my gate, by soldiers, and taken, as well as I could judge, about two miles, through large masses of ruins, crowded bazaars,† (the people giving way), and numerous narrow streets. Not a word; but at each gate my guard pronounced the word El Hadge, and we passed. Arrived at a low door-way, a black slave asked for the word—this was pronounced—and then my dragoman and I were ushered into a narrow passage in total darkness. Through the court-yard into which this opened we observed several persons pass out; when a small door opening behind us, the Minister (whom we had seen at the palace in the morning) was waiting to receive us. Tea was brought, and in the centre of this room stood a single chair, on which I was to sit. I was then bade welcome in the name of the Sultan, [and was told] that I was to consider myself his guest; that I had only to wish, and it should be granted; that his master was only waiting for the fast to terminate, when he would see me. A host of fulsome compliments!

"I was then shown the vegetable productions of the country used as medicines; requested to report upon them; and questioned as to the progress of medical science. I spoke of the countries I had visited, and was assured that I should find more to be pleased with in my reception here. I was then asked to feel the Minister's pulse, and report on his health; then to know if I would examine his black ladies, two of whom were but so-so,—a pretty job! I played my part well. Orders were given that no one be

* Baïrám, or, 'Íd ed Dohá.

† Aswák, plural of Sók, or Súk, the Arab word for market—bázár in Persian.

admitted. I was then told that the Lieutenant-Governor of the Meshwar * would come in the morning, and take me to all the Sultan's palaces and gardens, and that a guard would be at my command whenever I wished to go out. I shall describe all these to you when I get home. I am under a strict espionage, and worried to death with patients. I saw the Sultan whilst passing through his palace, and have received his orders to visit him on Friday. His favourite wife is ill, and the difficulty is how to let me see her. I have refused to prescribe for her, without. The court-physician is here twice a-day, and I have assisted him in one or two cases, and he thinks there never was such a doctor. A Seidlitz powder astonished him beyond all belief. I go next week to Atlas to visit some strange cities inhabited by Jews. Of these I write to His Royal Highness. El Hadge is here again, to say the Sultan has sent him to say that five of his guard will be here in the morning to conduct me to the great markets, and after this to an inspection of the cavalry, and to ask if anything can be done to make me more comfortable."

Notwithstanding his incessant and wearisome occupation as both physician and apothecary to the Maroquine Court, Mr. Davidson found leisure for scientific inquiries, not forgetting those to which his attention had been particularly directed by H.R.H. the President of the Royal Society, who with his well-known condescension had desired this enterprising traveller to correspond with him. The result of his first inquiries was communicated in these terms:—

"*Morocco, 3rd February*, 1836.

"SIR,—I have deferred taking advantage of your Royal Highness's condescension in permitting me to address you, hoping that I should 'ere this have made my excursion to the five villages in the valley of the Southern Atlas, inhabited by Jews, who differ much from any I have yet met with. Hitherto I have been able to glean but little from the few who visit the city, which is principally supplied by them with charcoal; but having this day received the Sultan's permission to proceed and to continue my journey to Wadnoon (from which place I hope to join a caravan now collecting, to proceed to Soudan), should I succeed in this, I should not have an opportunity of addressing your Royal Highness; an honour of which I shall ever feel most proud.

"The Jews of Atlas are far superior, both physically and morally, to their brethren residing among the Moors. Their families are numerous, and each of these is under the immediate protection of a Berber (the aboriginal inhabitants of North Africa), patron, or master. They have, however, their own

* Meshwár, Council.

Sheik, a Jew, to whose jurisdiction all matters are referred. Differing from the Jews residing amongst the Moors, who are punished by the Mussulman laws, they are not in the same state of debasement or servitude; their case is one of patron and client, and all enjoy equal privileges, and the Berber is bound to take up the cause of the Jew upon all emergencies. They all carry arms, and serve by turns with their patrons. They state [that] they did not go to the Babylonish captivity; that they possess many writings; that they have a city cut out of the solid rock, with rooms above rooms, in which they dwelt upon [their] first coming to this country; and that there are some writings carved in these rocks which they attribute to some early Christians who came and drove them into the valley [which] they now inhabit. As I purpose making some few days' stay amongst them, under the plea of searching for medicinal plants, I hope to be able to furnish your Royal Highness with some interesting particulars respecting these people, and to discover if these reports be true. I have received an invitation from their patriarch, who wishes to be informed the day before I visit them; it being his intention (having heard I had paid some attention to the sick Jews residing here) to come out to meet me. Your Royal Highness will scarcely credit the ignorance and debasement of the Jews of Morocco. The chief of the Millah, their Quarter, was astonished to hear that the Bible used by the Christians contained the Psalms of David; and much more so, to hear that the Psalms were sung daily in our churches. I have endeavoured in vain to learn anything from them on your Royal Highness's question as to the change of their time. I have been detained above a month in this city, owing to the indisposition of the Sultan, and the sickness of many of his favourites, and have been appointed court-physician. My stock of medicines is nearly exhausted, and having to see upon an average, fifty patients a day, and compound the whole of the medicines myself, my own health has begun to suffer. Although I am fed from the royal table, I have no time to take my food; my patients coming at break of day, and remaining till dark; and I am seldom able to prepare the necessary medicines before midnight.

"I have a respite, if it may be so called, having to go to the Sultan every morning, but then all his ladies have something to ask for; and before I see his Highness I have to write from the mouths of the eunuchs all the ladies' complaints, and bring them something the next day. This is unknown to his Highness, to whom I have respectfully refused to prescribe, unless I can [see] my patients. The head-physician has been ordered to spend two hours a-day in my room, to learn my treatment, and his son is to come in the evening, and see the mode of compounding medicines.

The common Moorish doctors, who have but one remedy, firing, have been sent to perform their cures before me; I have had to make a report upon the state of medical science in all the countries I have visited, and to examine the few medicines they use, and state my opinions. Having accidentally stated [that] I believed many of their complaints arose from the manner of preparing their food, I have had to taste all the Sultan's dishes, to mix simple drinks for him, and to look at the soil in which his vegetables are cultivated. But all to no purpose; they prefer their own plan to any recommendation of mine. I am happy, however, to inform your Royal Highness, that by strictly complying with their wishes, and having been more than [ordinarily] fortunate in my practice, I have made many friends, succeeded in removing suspicion, and obtained from the Sultan the promise of every assistance. He has presented me with a fine horse, given me a guard of ten soldiers, and promised me one hundred to escort me to Wadnoon, where his territory finishes. I am in treaty with the Sheik of Wadnoon, having offered him one thousand dollars if he will ensure my life to Timbuctoo; and the only difference now is between accident or climate. But as I well know that every accident will be construed into climate, I will not pay the sum till he places me in the city. I beg now most respectfully to present my humble duty to your Royal Highness, and with my fervent prayers that your Royal Highness's health may be perfectly established,

"I have the honour to remain,

"Your Royal Highness's very obedient, humble servant,

"JOHN DAVIDSON."

Early in March, 1836, the Emperor's health having been restored, his English physician was at length permitted to travel, not, as he wished, to the S.E., but to the S.W.; the route by Tâfilêlt being interdicted by the good-will or jealousy of the Sultan. Mr. Davidson, however, was prepared for this disappointment, and had already taken steps to secure a good reception among the Arabs of Wád Nún, on the north-western border of the Ṣahrá. On the 7th of March, 1836, he announced his arrival at Agadir, or Santa Cruz, in a letter to his brother, which has furnished the following extracts:—

"I was detained by the snow after leaving Morocco. . . . My reception and stay at court has surprised everybody. I have the most favourable promises of support and assistance, but do not believe quite all that is said, the Sultan having made me promise to return to his empire, and pass some months at Fez, or Mequinez, to instruct his people in the practice of medicine. Leaving Morocco, I attempted the ascent of Atlas, at Trasremoot, but at the elevation of five thousand feet was compelled by the snow

to descend. This led me to visit a line of country as yet unseen by Europeans. I inspected more than one hundred villages of Jews and Berbers, was well treated, and orders had been given that at each principal place the governor should come out to meet me with his people under arms; that the principal towns should furnish three hundred fowls, ten sheep, and ten ducats for my maintenance, and provide barley for my horses and mules, and those of my soldiers. At the places where I only passed, the chief of the Jews were to come and make offerings of milk and wine; the former being changed from the primitive or patriarchal offering of bread. These I had to touch and pour a little of each on my horse's mane. This done, food, both raw and dressed, was offered; and after a sort of song, I was suffered to proceed. At all the valleys they were desired to bring me the productions, and to show me any and all plants used as food or medicines; and on these I had to pronounce an opinion.

"My practice as a medical man has been so fortunate, and my distribution of medicines so general, that I have had work to answer even the questions. During my stay in Morocco, twelve hundred persons passed through my hands, and I had, at one time, the Sultan, several of his Ladies, the whole of the Ministry, the Cadi and Judicial Corps, the Commander of the Forces, and the four great Saints, Seedy Ben Abbas, Seedy Abdel Kader, Seedy Bush Eib, and Seedy Omberak,* under my care. The Zaíre, of whom I wrote to you, and who intended to make me their prisoner, have broken into open warfare, and the people here are only waiting for the Sultan's departure for the north to commence a disturbance. These people are all favourable to letting me pass, and the Suses and the Waled Abusebas,† whom I had been told to fear, have sent to beg of me to come on. My present difficulty is to get out of this empire. I have the Sultan's order to remain at Terodant,‡ he having no power to protect me beyond this; but Sheik Beirock, of Wadnoon, informs me he will; and had I not applied to the Sultan for a letter of protection, he would have taken me and passed me across the Desert, provided I would pay him a consideration.

"He will send me by a route used only by his couriers; but for this, at this season, I must take water and provision for two months, and send on some dromedaries, which will be posted about midway, where I have to halt: and by leaving my tired ones, and proceeding without a stop, I shall be able to pass before the Tuaricks have knowledge of my arrival. All this I feel I can do; but my companion, Abou, is, I am afraid, quite unequal to it. Sheik Beirock's brother, who is with me, tells me Abou will be

* Sídí Ibn 'Abbás, 'Abd el kádir, Abú Sheïb, Mubárek.

† Aulád Abú Sebá, the tribe of Father Lion. ‡ Tárúdánt, capital of Sús.

a safe passport for me, as soon as I arrive in Soudan; that one of his family is the present Sheik of Timbuctoo, and that his cousin, the son of Abou's uncle from whom he was stolen, is now the king of Houssa. He was fully acknowledged at Morocco, and my dragoman had orders from the palace to treat him with respect, as he was a Muley (prince). How we shall get on, I know not. I shall write one letter after I know the Sultan's intention, but if you should not hear for some months, you may rest satisfied [that] I have passed Wadnoon. I feel that the same Providence which has hitherto preserved and protected me, will guard me through all the difficulties and dangers I am about to encounter. Should I not get on, I shall make a virtue of necessity, return to the Sultan at Fez, and make the best excuse to get to Tafilelt. I am, thank God, quite well, and have commenced training, taking two spare meals a-day, living principally on bread, rice, eggs, and weak tea; no wine, and very rarely meat; exposing myself much to the sun, and sleeping in the air."

The Sultán had commanded Mr. Davidson to wait at Téródánt, the capital of Sús el aksá, about forty miles south-east of Santa Cruz, till he should be able to afford him a secure protection in his progress southwards: but a correspondence already established by the traveller with the Arab chief of Wád Nún, who is in name only subject to the emperor, and has the power of securing a passage across the desert, and impatience of further detention after so long a delay, made him anxiously entreat permission to advance as far as Wád Nún, and instead of remaining at Téródánt,* he repaired to Suweïrah or Mogador, about seventy miles due north of Santa Cruz, where he had the advantage of enjoying the society of Mr. Willshire, British Vice-Consul, on whose aid in promoting his views he knew he could rely. From that place he had again an opportunity of addressing the Duke of Sussex.

'*Mogador, March* 18*th*, 1836.

"Sir—After a fruitless attempt to cross the western branch of Mount Atlas, owing to the unusual quantity of snow, I have been obliged to come to this place, which affords me another opportunity of taking advantage of your Royal Highness's condescension in permitting me to address you. Having received the Sultan's consent to cross the mountains for the purpose of visiting the Jews, I left Morocco for Mesfywa, and taking the route by

* May we be allowed to lament the impetuosity of our lamented traveller's zeal? At Téródánt he would, for a considerable time, have had ample occupation for every leisure moment. In a country known only by name, abounding with vegetables and fossils never yet examined, and in the midst of the Berbers, whose history and habits so few have been able to study, supported also by the favour of the Court, how largely might Mr. Davidson have increased our stores of knowledge, had he been willing to yield to the Sultan's precautions!

Trasremoot, reached an elevation of 5000 feet; but here the loose character of the snow, and the uncertainty of the track, obliged me to abandon my project. I was accompanied in this journey by a Rabbi, from the district of Coubba or Cobba, to which place it was my intention to have proceeded. From this man I received much curious information, and have yet great hopes of reaching the people of whom he spoke, and to whom he belongs, before I return to England. He informed me that in this place, nearly as extensive as that in which the city of Morocco is situated, there are not less than 3000 or 4000 Jews living in perfect freedom, and following every variety of occupation; that they have mines and quarries which they work, possess large gardens and extensive vineyards, and cultivate more corn than they can possibly consume; that they have a form of government, and have possessed this soil from the time of Solomon; in proof of which he stated [that] they possess a record bearing the signet and sign of Joab, who came to collect tribute from them in the time of the Son of David; that the tradition of their arrival here runs thus—'Crossing the Great Sea to avoid the land of Egypt, they came to a head of land with a river; that here they landed, and following the course of this leading westward, but going toward the south, they came to a spot where they found twelve wells and seventy palm-trees. This at first led them to suppose that they had by some means got to Elim; but finding the mountains on the west, they were satisfied that they had reached a new country: finding a passage over the mountains, they crossed and took up their dwelling in this valley, first in caves, which exist in great numbers, then in others which they excavated, and after this began to build towns; that at a distant period, they were driven across the mountains by a people that would not acknowledge them, and that some remained at Diminet, Mesfywa, and other places on the western side of the range.' Looking at the map, and following this man's observations, it is perfectly easy to trace them. They must have reached the gulf of Tremesen, and taking the river Muluwia, or Mahala, have reached Tafilelt, where, to this day, are twelve wells planted round with seventy palm-trees, and which many of the Jews call Elim; and from this they [must] have taken the pass to which I attempted to get. Knowing the interest your Royal Highness takes in all that refers to the history of the Jews, I have offered this man fifty dollars to obtain a copy of the record upon a skin of the same size and pattern as that which contains it, and ten dollars for the copy of two tombstones to which the Jews make their pilgrimages, and these he promises to send to the Jew agent in Morocco in six months, provided I do not in the mean time visit Coubba. On asking him if, at any period, they had a great

accession to their number, or if he knew anything of the breaking off of the tribes, he seemed anxious to drop the subject, and told me that the more learned men whom I should see at Coubba could better inform me; that from time to time, Jews came to them, but that these tombs and the writings they possess contain all their history. This man returned with me. I was most anxious to know the meaning of the names of some of the towns: he told me what the Moors call Mesfywa is Oom Siwá, the Mother of Siwá,* one of their families which crossed [the mountains]; that Ourīka† of the Moors, distant thirty miles, was 'Rebka, founded by one of their daughters, and that most of these places had originally Hebrew names. At Ourīka he left me. I continued for eight days to visit the towns inhabited by the Jews, to the number of above 100, and I should say that on this side there are more Jews dwelling with the Berbers in the mountains than resident in Morocco. They have all the same account of Coubba, and have a great belief in the Cabāllists, who they say still exist, and who receive direct communication from Heaven. I here send your Royal Highness a few of the names of the principal towns, but having lost my Rabbi interpreter, cannot procure the meaning of them: Argum, Rōōsempt, Towra, Towright, Ai Tattab, Tamazert, Zowisiderhald, Tedēēli, Tisgin (very large, 200 families), A Mismish (150 families), Sefélmal, to the town on the Wad el Fis."

The remainder of this letter is taken up with an account of a singular physiological phenomenon, if Mr. Davidson was not misled by erroneous information. He says that he had been told hermaphrodites are found in great numbers in the empire of Morocco; that they are avoided as impure, and specially mentioned in the Muselman law; that the Sultán's minister, Sídí Ibn Idrís, one of the best informed persons in the empire, assured him that there are numbers of them at Fez. The only individual called a khunthá, or hermaphrodite, whom Mr. Davidson had an opportunity of examining, was one of those cases of imperfect formation which are occasionally met with in Europe.

At the close of the above letter he adds, "I am happy to inform your Royal Highness that I have the greatest support from Ben Dríss in favour of my proceeding to Soudan; and he hopes the Sultan will order my return by Tafilelt to Fez. I have completed my arrangements with the Sheik of Wadnoon, who undertakes, for a sum which I deposit in the hands of the consul here,

* This is doubtless a mistake, unless the Jews call the place Umm-Síwah. The man did not understand the meaning of the name, and therefore said this to screen his ignorance.

† This is Aghmát Warīkah of the Arabs, so named from a Berber tribe, to distinguish it from Aghmát Aīlán.—F. S.

Mr. Willshire, who has managed the matter with great judgment, to place me safely in Timbuctoo, provided the Sultan of Morocco does not object. I only wait the answer to the letters sent to make this request. My companion Abou's family is still on the throne of Timbuctoo; Hamed Libboo, the present king, being one of his cousins, and Fehidier, king of Houssa, another of his relations, and Woled Munsor Enēēloo, king of Bambara, is well known to him."

In the month of April, 1836, Mr. Willshire, H. B. Majesty's vice-consul in the empire of Morocco, received the emperor's royal passport for Mr. Davidson and his companion to proceed from Agadeer to Wadnoon, in consequence of which they immediately set out, and reached that place on the 22nd of April,* but as no caravan was then likely to be assembled, they were long detained in that sultry region. During this interval Mr. Davidson again addressed the Duke of Sussex.

"*Tekinecou, Wadnoon,* 3*rd July,* 1836.

"Sir,—Presenting my humble duty to your Royal Highness, I beg leave to offer my most grateful thanks for the letter and its enclosures, and for which I shall ever feel indebted to your Royal Highness's condescension. This, with other letters, found me returned to this place, after several ineffectual attempts to prevail upon any of the tribes to escort me across the Sahara,† on the confines of which I have been for the last three months, with the prospect of a further detention to the commencement of September. The objection of the Sultan of Morocco to my entering the district of Suse is owing, as he stated, to the dangerous and unsettled state of the country. The difficulties and delays with which I had to contend in passing through the numerous tribes now settled in the countries of Upper and Lower Suse, having no semblance of government and acknowledging no power, brought me to Wadnoon too late for the spring Cafilas,‡ and at a period when the intense heat deterred even the Arabs from attempting the Sahara. Money, that all-powerful engine, prevailed upon five of the best of the Dummances, who came with the van of the great Cafila from Soudan, to undertake with Sheiks Mohammed and Khiafee (who have each made the journey twenty times) to conduct me in safety to Timbuctoo, provided they were guaranteed a certain sum of money; but this only at the request of Sheik Beyrock, under whose protection I have been for the last three months, and for whose permission to pass I have already paid very heavily. All our arrangements were completed the 6th

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* Mr. Davidson's Letter, Journ. of Geogr. Soc., vol. vi. p. 430.

† Ṣahrá is a large level area, a plain, but applied peculiarly to the Great African Desert.

‡ Ḳáfilah, the Arab word answering to the Persian Kár-raván.

of June, the day appointed for starting. On the 4th of this month the Great Cafila, which was twenty days behind its time, reached the encampment from which I was to have started: this brought sad news. It had been attacked twice on the route; the last time only four days' journey from this place, thirteen persons killed, much property taken, and many slaves set at liberty. The Dummanees had charge at this time, and were bound to avenge this. They attacked a large encampment of the tribe Erdghebat, the assailants of the Cafila, carried off one thousand camels, three hundred horses, and twenty-eight of the choicest slaves. This at once sounded the tocsin. All the tribes were in arms, each calling upon the other to take their parts. The Erdghebat attacked the town of Tajacanth, two days' journey (forty-six miles) from this, but were repulsed by the Dummanees, in whose district the town is, with the loss of forty killed and one hundred wounded, most of whom have been brought to me for attendance, the Dummanees losing but four men, and having sixty wounded, many of whom also are here. Sheik Beyrock is almost the only person whose people are not involved in this quarrel. He is the great arbiter and the most powerful of them all. They have all sent deputations to him, which has afforded me an opportunity of seeing portions of most of the tribes. My position is far from enviable; the jealousy and *amour propre* of these people is beyond all belief. I am charged with favouring one whose large arm requires two splints to support the fractured bone, or looking down upon another as puny, because I give him but two pills, whilst others less daring than himself take three. I have, however, managed to keep pretty good friends with all of them. This place offers but little of interest on which to address your Royal Highness. I hope I shall be enabled during my stay to correct some trifling geographical errors, particularly as to the course of two rivers passing through this district, and the Wad Draha,* which finds its way to the sea. I have, however, the satisfaction of informing your Royal Highness that I have positively arranged my departure, under a heavy forfeiture and disgrace for non-compliance on the part of the Dummanees, for the 21st of Jumád Awwal, our 1st of September, to halt three days at Tajacanth, and to perform the journey to Timbuctoo within forty days: for this, however, I have to pay very heavily. The arrangement has been made since I commenced this letter, which I have the honour of addressing to your Royal Highness, discussing the matter two days; since when many of the chiefs of the tribes were here, by express order of Sheik Beyrock. I told them at once that I wanted to go to Soudan; they knew it, and had been

* Dar'ah, pronounced Dr'ah.

sent for the purpose; that the two Sheiks, Mohammed and Ali, of the Dummanees, were to take me, and that I had already given Sheik Beyrock what he asked to ensure my safety, and now wanted to know what they would require for their camels and escort; the sum demanded was so exorbitant that I said at once I would give the matter up, go back to Fez, and request the Sultan to send me on. Upon this the Deleïm* said, 'You don't go back without giving me five hundred dollars to pass my district.' The Abousebah,† a day's journey to the north of him, said, 'If the Deleïm gets this, so will I.' I appealed to the Sheik, who said he was as much astonished as I was. Seeing this, one of the party, who was the constant referee, said, 'Christian, we are all pledged to protect your person: no one will harm a hair of your head; stop where you like; your person is safe; we all know your name—Ben Daoud.‡ We have promised this to Sheik Beyrock. One from each tribe will be with you, but pay you shall. We said nothing about your money; all we were asked was to protect your person, to swear none should harm you. Depend upon us; we keep our word, but go which way you will, you shall pay.' The Sheik begged me to leave it in his hands: he admits he has drawn a great expense upon me, and has told me, under the circumstances, to write to the vice-consul at Mogador, who knows all these people, [in order to] get him to say what I ought to give, and he will make up the rest. Seeing my position, and recollecting the sibyl's books, I offered one half the amount asked to take me to Timbuctoo, which within the last hour has been accepted, and we have eaten some salt since.

"I find here still the Jews. The same precise account of their arrival and taking up their residence in the valleys of Atlas. One is here from Jerusalem begging alms, unusual amongst the Jews. He is advanced in years, quite blind, and has kept constant pace with me, taking advantage of my escorts from Tangier to this place: is anxious to get to Arowan,§ where there is a very learned Rabbi. I cannot help him; my means will not allow me. They ask nearly as much for his passage as my own; having a greater fear of the Jews getting to Soudan than the Christians. I trust by this time your Royal Highness has recovered your perfect sight, hoping that about the period of this letter's reaching England, your Royal Highness will have received the copies of the inscriptions from the tombs of the district of Mesfywa. I can hardly expect the copy of the record from Couba or Kobba will reach Morocco till the end of the autumn, when the Rabbi told me he should be returning, and would deliver it to the Consular Agent, the Jew Courkoss, to whom

* Delím, or the diminutive, Duleïm. † Abú-s-seba, *i.e.* Father Lion.
‡ Ibn or Bin Dáúd, David's Son. § A'ra-wán.

I have several times written. My companion begs most respectfully to present his duty, and hopes your Royal Highness will deign to receive the few lines from his pen, which he begs me to enclose. I am sorry to say I have great fears for his health; he cannot bear fatigue, and has been attacked with ophthalmia. The whole of the Soudan people know him, and tell me he will prove a certain passport; that he is a cousin of Hamed Libboo; and another of his cousins, Ali, called Koutouk, the warrior, is now king of Kong, and that many of his family are at Kong, all rich and in power.

"Hoping this will find your Royal Highness in the enjoyment of perfect health, and trusting shortly to have the honour of addressing your Royal Highness from Soudan,

"I have the honour to be, &c. &c.

"JOHN DAVIDSON."

In the territory of Wád Nún the traveller's patience was severely put to the test. He was detained there from April till November. From Glamiz he wrote to his brother, on the 25th September, as follows:—

"Since my last letter, I have made three ineffectual attempts at getting on, although I now begin to feel somewhat confident that Sheik Beyrock, with whom I still am, never intended sending me till the end of this month, he being so fully pledged for my safety and due arrival, that fearing the heat and the unsettled, nay warring state of the tribes, did not choose to run these double additional risks. On the 25th of this month there is, by mutual consent, a general cessation of hostilities, to enable the tribes to attend the great Socco* of El Shig, held at ten hours' ride from this place, and at which the Arabs dispose of the produce of their flocks and tents, and lay in their provisions for the whole year. The armistice lasts for six days, to give time for going and returning, the market occurring on the 28th and 29th. Of this it is intended I should take advantage, and as my people do not purchase anything, but merely come as a cloak and take me off, we shall get three full days' start, and be nearly out of the reach of danger. I am now going on in a very different style from that mentioned in my last, partly by taunting the Tajacanths as being cowards, and more perhaps by holding out to them the rich harvest they may gain by having the whole market for salt, purchased at Toudeyny, which supplies Soudan, to themselves. Paying, as I am, an enormous sum to go on, and advancing money for the purchase of salt, to be repaid on arrival at Timbuctoo, or in the event of accident, to be returned to Sheik Beyrock, who is to replace it in the hands of the Vice-Consul at Mogador, I now take the whole

* Sók or súk, i. e. market or fair.

of this portion of the Tajacanths, to the number of two hundred men and six hundred camels. Our arrangement is as follows:— On the 25th, when the Sheiks with two hundred camels and sixty men start, as if to visit the Socco, two hundred camels with corn and water will proceed direct to the Sahara; thirty camels will be detached from those accompanying the two Sheiks, and come here for my baggage, which by this, you will say, is no trifle, the presents I am obliged to carry and the money (the cowries), ten camel loads of which does not amount to one hundred pounds sterling, being all bulky. After showing themselves at the Socco, they will join me on the road; we shall proceed to the tents, where we shall arrive on the 28th. A second two hundred camels with sixty men will proceed immediately. We remain two days to pack up our tents and grind zimeta,* the food eaten on the road, and carrying nothing with us but my baggage, which will now be divided between fifty and sixty camels, and make all speed to overtake the two former divisions. We shall materially lessen the load of the first, by giving drink and food to our own beasts, and loading those who for three or four days have carried nothing; and in this way push on to the first division, making no stop, with but very short nights, till we arrive at Toudeyny; there all will be loaded with salt, and this will require from eight to ten days. I hope, however, to find Hamed Libboo's nephew there, and who no sooner hears there will be no regular Cafilá this year than he will be off with the news. I shall join him, provided poor Abou, about whom I have great fears, as you shall hear presently, can bear the journey. All are in great spirits, the people here believing that I have suffered so much on my last trip, from which I returned four days ago, that I have abandoned the idea of going on, and am now only waiting till I see El Shig, and go back to Fez. This is all very good, and I keep up this story: 'tis a very unsavoury one for me, as I cannot make the least preparation in the way of food for the journey, and forty-five days' hard travelling, and barley and dates ground up together and mixed with milk or water, is but poor food. Meat is given, but twice at Toudeyny and Arowan, at both which places the Cafilas rest. I have had a task of ten days' hard work on dry bread, and that not the sweetest at the end of the time, and one piece of fish, but am better in health for it, but not much fattened by it. My two first excursions were productive of little information or amusement; not so my last, which was replete with incident, and afforded me both pleasure and information. We started from this place, accompanied by the Sheik, and about a dozen friends and house-slaves, under the impression that we could have reached the tents of the

* Ziweïtah or zumeitah, a kind of paste made of millet (dhurrah).

Tajacanths, to which, if we got, my things were to have been immediately forwarded. The first day convinced us of the impossibility of this, and not wishing to appear foiled or disappointed, we proceeded to the river Draha,* passing a beautiful country as far as scenery, but wholly without drinkable water, and came to the sea where this river empties itself. I had not for some weeks past eaten any of the food cooked in the Sheik's house, but had been living on some stuff furnished by the Jews residing here: they received orders to prepare a bag of bread for the Christians, with which we started, the Sheik carrying tea and sugar; after a ride of eight hours, we halted at a very powerful spring of water, but so salt, that neither the Sheik's horse nor mine would drink, and by a sort of law here, horses are neither allowed food nor water for twelve hours before they commence a journey: four small loaves were divided among the party, and those who liked took a small draught, not an effervescent one. We remained half an hour, and proceeded, crossing a fine chain of hills, starting many herds of gazelles, and after two hours arrived at a large encampment, where we slept. Tea was made, but of the same water we had passed, and the boiling had far from improved its saltness. The preparation for dinner was too disgusting, and I will spare it you. We started the following day before daybreak: the heat being excessive, we were obliged to cover the stirrups, &c. with our haiks.† At one P.M., going S.E., the thermometer was 140°—112° in our tents at night. Reached the wells, and found much cattle, but water salt. Here we got plenty of camels' milk. Rode till six; halted, and killed two large wolves and many snakes. Off early, and crossed the mountains of Ab el Assel,‡ at the foot of which we found Bahra, one of Sheik Beyrock's sons-in-law, with 1000 camels. Here I saw much of Arab life—the settlement of points of law, marriages, and divorces. Here the story-teller and the bard divided the night between them. The wild Arab girl danced and sung the praises of the Sheik, and the poor Christian had a ditty composed in his favour. Next day we turned towards the sea; killed some wild boars: at the sea, got some fish;—and turned homewards, taking a different route; but no water except salt. I was ten days on this journey, and travelled, on an average, ten hours a day. Before this reaches you I shall be on my way to Timbuctoo. An express will be sent on my arrival.

"Faithfully yours,
"JOHN DAVIDSON."

On the 2nd day of November, he says, in addressing Lord Palmerston,—

* Dar'ah. † Háyik, *i. e.* white woollen wrapper.
‡ Abú-l'asel, *i. e.* Father Honey.

"Since my letter to your lordship I have visited Sheik Beyrock. The map is but an indifferent guide; there is no such river as the Akassa: it is the Assaka, running near to this place: between this and Glamiz are two other rivers, not laid down at all, the Boukoukmar and Syad. The point at which Sheik Beyrock wishes to form his port is the mouth of the river Draha (from El Wad Draha),* which, according to my reckoning, is 32 miles S.W. of Cape Noon, and should occupy the place marked on the map Akassa.

"I fear Sheik Beyrock has far overstated his means, but not at all the capabilities of the country. I am confident much may be done, in a commercial point of view, with these people; but he wants a better port than the Wad Draha—shallow water, heavy surf, and many sand-banks: he has, however, shown much judgment in the selection of his position.

"The Wad Draha, rising a little S.W. of Tafilelt, runs through the productive districts of Draha and El Harib,† passing near to Tatta and Akka, skirting lower Suse, finds its way to the sea through the fertile country possessed by the tribes of Errub, Draha, Maraibat, Tajacanth, and Ergebat. These people can furnish large quantities of produce, and could, according to their own account, be great consumers, could they purchase goods on more reasonable terms. These people have in their hands the largest portion of the Soudan trade in gold, gum, ivory, and ostrich feathers; they rear large quantities of wool and skins, and in the districts N. and E. of this, immense quantities of oil, wax, hides, and almonds."

On the 11th of that month, Mr. Vice-Consul Willshire informed the Secretary of the Royal Geographical Society that on the 3rd Mr. Davidson, at whose patience and high courage he expresses his astonishment, wrote in spirits at the prospect of leaving a place where he had suffered so many annoyances, vexations, and disappointments:—

"'Even now,' he adds, 'after waiting for the Cafila, which will be immense, near 400 men, and, they say, 2000 camels, I am not even going with it. I should, by all accounts, as a Christian and a doctor, be worried to death. I go straight from this to Arowan, never touching the Cafila route at all; we shall not see a single tent. There are some wells, known only to two or three of the guides. We take five naggas (she camels) for milk, the five men, and Mohammed El Abd, some zimēta (barley meal). I take the biscuit for Abou and self; each carries a skin of water, to be touched only if the milk fails: thirty days to bring us to Arowan, and five more to Timbuctoo.'

* El Wád Dar'ah, the Vale of Dar'ah.
† El Gharib, pronounced by the Berbers El 'Arib.

"I have made the above extract to assure you that the arrangements were made, and Mr. Davidson ready to start at a moment's notice, and that in the course of two or three days I hope to have the pleasure to acquaint you of his having proceeded on his journey. Once away from Wadnoon, and I have every and the fullest confidence of his efforts being crowned with success.

"I have the honour to be, Sir,

"Your most obedient servant,

"Wm. Willshire.

"P.S.—I open this letter to add, I have received a letter from Mr. Davidson, dated Saturday, the 5th inst., who appears in high spirits, and writes,—

"'The start is to be on Monday, although I do not go on that day; everything is now packed up, and placed ready to be put on the camels, with which Abou starts at day-break on Monday. I am to be left here, as if having sent him on. Mohammed El Abd remains behind. On Wednesday or Thursday, according to the distance made by the camels on the first day, we start on horseback, accompanied by Beyrock, and about six horsemen, and are to make Yeisst, if possible, in one day. Here I leave the district of Wadnoon. And to this place is three days' journey for loaded camels. I here leave my horse and mount my camel, and we push on to the tents.'

"Mr. Davidson did not start on a sudden, on the 3rd inst., as stated to me by a courier, who brought me a letter from him of that date, and which I reported in a letter I had the honour to address to his Majesty's Secretary of State, Viscount Palmerston, on the 8th inst., and which you will oblige me by correcting and making known to his lordship.

"Your most obedient servant,

"W. W."

The following extracts from Mr. Willshire's letters will give all the intelligence received respecting the sequel of Mr. Davidson's expedition :—

"*Mogadore*, 13*th Dec.* 1836.

"Sir,—I had the pleasure on the 28th ultimo of announcing the departure of Mr. Davidson from Wadnoon, on his route to Timbuctoo, and I beg to acquaint you, I have since had the satisfaction to receive a letter from him, dated Yeisst, 15-16th ult., from whence he writes to me,—'All is at length settled, and we start to-morrow morning at first-day. I believe also the Cafila will be allowed to proceed, although one mitcal a-head is to be paid by all who pass: we have here above fifty persons, and one hundred camels. I am unable to tell you for certain the route I take; this is to depend upon circumstances. But two persons besides Mohammed El Abd accompany us; so that after all the talk of

Wadnoon, I am going in my original way, of a party of only five, including Abou and self.'

'" Yeisst is three days' journey south of Wadnoon, from Temzirst, (which place Mr. Davidson describes as a beautiful ride of eight hours, and speaks in high terms of the attentions and civilities of Sheik Hammo, who, with a party of twenty horse, accompanied him from Temzirst to Yeisst.) Mr. Davidson remarks,—' Every step we have taken from Wadnoon we have found the people better, more liberal, more hospitable, and although somewhat savage, having yet a little mildness of character, of which there is none at Wadnoon.'

" At the date of the latest letters received from Sheik Beyrock, Mr. Davidson had been gone from Yeisst eighteen days, without there being any intelligence of him, which argues favourably for his safety; the greatest danger being upon the borders of the Desert, where there are many wandering and warlike tribes.

" I have reason to believe Mr. Davidson and party have pushed on as fast as possible: the journey was to be done in a very short time, as the camels were only to drink six times; and by not visiting the tents of the Tajacanths, nearly six days' journey would be saved."

" Mr. Davidson, in the concluding paragraph of his letter, writes —' I am happy to say I have picked up amazingly, and have now no fears about my health; and I beg to assure you I flatter myself with the hope, that the intrepid traveller may pass a merry new-year's day at the famed city of Timbuctoo—which event I trust to have the high pleasure of announcing to you in about three months. Sheik Mohammed El Abd having promised to be the bearer of a letter, which he is to deliver for me, and say, —There is a letter from *Yahya Ben Daoud*; * the Tajacanths have kept their word.'—God grant he may, is the hearty and sincere prayer of, Sir, your most obedient Servant,

" Wm. Willshire.

" To Capt. Maconochie, R.N."

Translation of a letter from Sheik Beyrock, dated Wadnoon, 1st day of the month Dual Caada † (answering to the 7th inst.), received at Mogadore, 13th February, 1837.

" To our friend, Merchant Willshire, English Vice-Consul, Salam,‡ &c.

" We received your letter, by the courier, which we have read and understand. About the news of the Tibbib§ John Davidson, his death is certain—the Harib met him—death is the lot of all. We had arranged with all the tribes of Arabs who are known to

* Yahyá ibn Dávid, John the son of David.

† Dhú-l Ka'dah, the 11th Mohammedan month.

‡ Salám, salutation.

§ Tebíb, physician.

plunder persons and commit robberies on the road; we had ensured his safety with them. The Tibbib did not leave our house until we had previously received security from Eborria (of the tribe of Idowlet), that he might pass through his district of El Harib; we had no fear, because they are traders, and convey and pass the merchants of Tafilelt, and receive hire. El Harib did not go *that route* but to kill him (the Tibbib), and we have heard that the merchants of Tafilelt had given money to El Harib to murder him. Tafilelt is only distant one or two days' journey from the usual place of abode of the tribe of El Harib. As to the property of the Tibbib, nothing has found its way to this quarter; but should it, I will send it to you. His property will get to Tafilelt, where it will be sold, and you had better write to the Sultan Mulai Abderrahman, to give orders to his Vice-Roy to seek after his books, writings, and property.

"We inform you we have sent a friend to the Tajacanths, ordering a person to be despatched to Timbuctoo, to bring us Abou, who is gone there; and have given the strictest orders for every information and news how it happened, to be sent us.

"As to the envy, like that of Wold Isheme* and others we have heard of, you know better than any one what money the Tibbib had. The truth of all the news will be known, when the horsemen return from the Tajacanths. We will send it to you, and point out to you the spot or place where he (the Tibbib) was met, and the day he was murdered. His death would be first known at Tafilelt, from whence it would reach Fas, as many of the El Harib go to that city. We are far off, which is the cause of the intelligence being so long before it reached us. The station of the Tajacanths is twelve days' journey from this place, and it is three months that no one has come to us from thence, except this news, which came from Yeisst. The money which he (the Tibbib) lent to Mohammed El Abd make yourself easy about it: the day the caravan returns, we will get repaid, and remit it to you.—Inshalla †—Salam."

Translation of a letter from Sheik Beyrock, dated Wadnoon, 1st day of Dual Caada (answering the 7th inst.), received at Mogadore, 13th February, 1837.

"To Sidi Hadge Abibe, Salam,‡ &c.

"As to what you write about the Tibbib John Davidson, the party of the Harib found (or met) him and killed him, plundering all his property, and that of Mohammed El Abd,§ which he had

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* Aulád Hishém, children of Hishám, a large Arab tribe.

† In shá-Uah, "If it please God!"

‡ To Sídí Háj Habíb; Salám: To my Lord, the Pilgrim; Habíb (or the beloved Pilgrim); Salutation.

§ Mohammed el 'Abd. Mahomet the Slave or Servant [of God].

with him of long cloths and hamburgas. On the day they killed the Tibbib they seized his companion Abou, and swore to him by the most solemn oath, if he did not show and tell of the property belonging to the Christian, they would take his life, upon which he discovered and told them of everything, which they took and went away with; and the reason why I did not write to you before now, I had doubts of the truth.

"How comes it that you listen to the words of Wold Isheme, who writes to the Jew his friend, and tells him the Tibbib had deposited with us the sum you mention in your letter? why did you not answer Willshire on the point, as you saw the money he delivered over to Mohammed El Abd? God be praised, we are known not to be traitors, like Wold Isheme: however, if his companion Abou comes, he will relate all the news with his own mouth.

"Be informed we have written to the heads of the Tajacanths Sidi Mohammed Dumanee, Sidi Mohammed Ben Annish, and Hamed Moolud,* to send persons like themselves to bring to us his companion Abou, from wherever he can be found; at all events, if he be alive, you will see him, Inshalla, and if dead, God's will be done.

"The words you report, that we had arranged with the Harib to betray him (the Tibbib), such doings are not our ways, nor would we degrade ourselves to do so; every one God will reckon with for the words he utters.

"For four days we neither ate nor drank, and have sworn by all that is sacred to be revenged. Whenever the Harib are to be found, in their tents or on the road, our tribe shall plunder and kill them.

"As regards the property of the Tibbib, if any articles remain in the hands of the Tajacanths, they will reach you. God knows how much we have grieved about him, but God be praised, we did not leave anything undone for the safety of the Tibbib. We did not think the Harib would turn traitors to any person sent by us. This has been done by the traders of Tafilelt, who had bribed the Harib to kill him. God's will be done: the facts will be known when the two horsemen return, whom we have despatched to the Tajacanth, and which will be sent to you.—Peace."

"*Mogadore, 14th February*, 1837.

"Sir,—I had the melancholy duty on the 1st instant to make you acquainted with the distressing intelligence which had reached me regarding Mr. Davidson. I am grieved at heart to inform you that all the accounts I have received since confirm the melancholy tidings.

Ah'med Moulúd.

"The most circumstantial account I have heard, I derived from a Jew trader of the name of Jacob Ben Cohen, who arrived here from Draha on the 2nd instant, and reported to me that Mr. Davidson had been robbed on the 29th or 30th of Shaban* (thirty-two or thirty-three days after Mr. Davidson started from Wadnoon), by the tribes of Idowlet and Ait Atta, in the district of Hameda, four days' journey from Tatta, who, after receiving from Mr. Davidson eight doubloons and one hundred dollars, and a loaded camel, allowed the party, consisting of eighteen persons, to proceed on their route towards Timbuctoo; Wold Hamdan † and Eborria, of Idowlet, and Wold Henna and Wold Aboo, of the tribe of Ait Atta,‡ he mentioned as the names of the robbers. My informant stated, that, eight or ten days after, a marauding party of 100 horsemen of the tribe of El Harib, who were returning from plundering a place called Bousbeyah,§ met Mr. Davidson's party a little to the south of Egueda, whom they immediately robbed, and shot Mr. Davidson, who received eight balls, and when dead, every one discharged their muskets at his body as a *meritorious act*. At *El Mehamdee*,|| a town distant six days from Tatta,¶ where my informant was living, he saw in the possession of the Arabs and Jews various articles which had belonged to Mr. Davidson, which he described, and left no doubt on my mind as to his fate. Among the articles which he had seen, he named a silver watch, a pocket-compass, sword, three books, a box of medicines, Japan tea-caddy, beads, and cowries, all of which he *must have seen*, or he could not have described them so correctly as he did. My informant could not give a certain account of the fate of poor Abou, the companion of Mr. Davidson, but understood he had gone on with the caravan, in which he is partly borne out by the letter received from Sheik Beyrock yesterday.

"Other accounts state Mr. Davidson and party were travelling some distance in a parallel route, but rather behind the caravan, which was first met by the party of El Harib, who were disappointed not to find Mr. Davidson, *for whom they inquired*. The caravan was stopped; and afterwards Mr. Davidson came up, when he was instantly shot. Another report inclines me to believe the Harib at first appeared friendly, and afterwards seized an opportunity treacherously to murder him at a place called Sheh'

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* Sha'bán, the eighth month; A.H. 1252, 29 Sha'bán = 8 December, 1836.

† Wold or Aulád Hamdán, an Arab tribe.

‡ Aït-Atá.

§ Bú Sebá-iyah (a place) belonging to the tribe of Abú Seba. M. D'Avezac writes Búzebayat, following probably Ibnu-ddén: an unsafe guide.

|| El Mohammedí, the Mahometan.

¶ The situation of Tátá has been determined with great probability by M. D'Avezac, in his Etudes de Géographie sur l'Afrique Septentrionale. See also Bulletin de la Société de Géographie, vii. 112.

Keya,* twenty days' journey from Wadnoon, and about twenty-seven days' distant from Timbuctoo.

"I have been much disappointed that the information received by the return of the courier I despatched to Wadnoon with letters to Sheik Beyrock is very meagre and inconclusive. In his letters no allusion is made to the robbery and murder of Mr. Davidson, as having occurred at different places, nor is the account of Jacob Ben Cohen supported in this point by any of the reports which have come to my knowledge, except the one received by my agent from his son at Morocco, which states that Mr. Davidson had been robbed, and afterwards allowed to proceed on his journey. I have no reason to suspect treachery on the part of Sheik Beyrock, although the reports set afloat by *Wold Isheme* are intended to create such a suspicion. The falsity of the report that Mr. Davidson had deposited a large sum of money with the Sheik, is evident.

"Considering there was a great probability Abou might have been taken by the tribe of El Harib, and detained as a slave, I directed the Sheik to procure his release, and to send him to me. By the answer he has returned, he appears to believe that Abou had gone on with the caravan, in which case there is not much likelihood of the horsemen despatched from the station of the Tajacanths overtaking it.

"I beg to acquaint you I have not yet determined upon what steps to take to collect further information, having only yesterday received the letters from Sheik Beyrock. It is my wish to despatch a Moor to proceed to Draha, to recover if possible everything belonging to Mr. Davidson: the great difficulty is to select a person well acquainted with the country, and in whom every confidence can be placed. I attach considerable value to the notes Mr. Davidson may have made on the route from Wadnoon up to the moment he met his untimely fate. I have in view a Moorish trader who has travelled in many parts of the Desert, and if I can come to an arrangement with him, I shall despatch him to Draha, with directions to proceed to the very spot; and everything I can do towards elucidating this melancholy affair, be assured, will be done. I mourn for my friend.

"I remain, &c.

(Signed) "W. Willshire.

"P.S.—I have omitted to state, that by the report of Jacob Ben Cohen, Mr. Davidson met his fate on the 8th day of Ramadan,† answering to the 17th or 18th of December last. Sheh

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* Afterwards Swekeya, which is probably more correct.

† Ramadán, the Mohammedan Lent, is the ninth month; A.H. 1252, 8 Ramadán = A.D. 1836, 17th December.

Keya, near the southern confines of the district of Egudedee,* sixteen days from Tatta, and ten days from Toudeyny.

"E. W. A. Drummond Hay, Esq."

Mogadore, March 7, 1837.

"The answer I have been looking so many days for from Sheik Beyrock, in reply to a long letter I wrote to him, only reached me this morning. In it he gives rather a different version from former reports. At Eguedee, on the 18th day of Ramadan, Mr. Davidson, and a party of Tajacanths, twelve in number, were at a watering-place, when a party of seventeen of the tribe of El Harib came up. It is stated, more as a surmise, than on certain information, that some of Mr. Davidson's party having gone to drink, leaving their muskets behind, some of the Harib cut off the party thus divided, when two of them immediately shot Mr. Davidson, and plundered the camels, tearing and destroying all his books and papers. The Tajacanths, who were plundered, and afterwards, with Abou, allowed to proceed on their journey, and are gone on to Timbuctoo, do not appear to have offered any resistance. The Sheik recalls the assertion made in a former letter, that the traders of Tafilelt had bribed the Harib to waylay and murder Mr. Davidson.

(Signed) "Wm. Willshire.

"E. W. A. Drummond Hay, Esq."

"*Mogadore, March* 14, 1837.

"Sir,—A trader of Wadnoon, named Sidi Ali Wold Ifkee, with whom Mr. Davidson was on intimate terms during his stay at that place, arrived two days from thence yesterday, called and gave me the following relation of the melancholy fate of that gentleman, which I believe can be depended upon, and is deserving of more credit than any other. The substance is as follows:—

"Mr. Davidson and party were first met by some of the tribes of Ilowbet and Ait Atta, who took from him some money, and allowed the party to proceed. The party reached Swekeya,† where they rested to wait for the caravan to come up. On the third day, a party of fifteen, or more, of the tribe of El Harib arrived at the resting-place, and after the usual salutations, inquired of Mohammed El Abd who he was travelling with? when he replied, a shereef, who was going to Gualata‡ on business. After some little conversation, the head of the party of El Harib requested Mohammed El Abd to show him the watering-place, who, leaving his musket behind, and the rest of the Harib *sitting down*, accompanied him over the sand-hills, and when out of sight, hearing a report of a musket, Mohammed El Abd asked what had been done, when the Harib replied, his party had shot the Chris-

* I'gidí. Mármol. iii. 19. † Before Shehkeya.

‡ Walátah of the Arabs, Aï-weláten (Aït Walátah?) of Ibn Batútah.

tian; he complained bitterly, and said he would rather they had murdered him. It is stated, that when Mohammed El Abd went away, one of the Harib pretended to examine his gun, and seized the opportunity to take aim, and shot Mr. Davidson, who was sitting on the ground a short distance from the party, who immediately began to plunder and seize everything belonging to Mr. Davidson, allowing Mohammed El Abd to keep possession of what property belonged to him, obliging him first to make oath on the Koran. That the caravan was not met by the Harib, but has gone on to Timbuctoo, with which Abou, the companion of Mr. Davidson, travelled.

"Sidi Ali added, that he had reason to believe that the first robbers gave intelligence of Mr. Davidson's route to the tribe of El Harib; and that had not Mr. Davidson stopped, he would have reached Toudeyny before they could have overtaken him.

"I am most sorry to observe, that I do not entertain a hope of receiving further or more correct particulars regarding the fate of Mr. Davidson than what I have communicated. He was aware of the perils and dangers of the journey; nothing could shake his determination, and his valuable life has paid the forfeit; but his name will be handed down to posterity, as one of the many victims who have nobly fallen in the cause of science.

"I am, &c.

(Signed) "Wm. Willshire.

"E. W. A. Drummond Hay, Esq."

XIV.—*A Sketch of the Progress of Geography;—and of the Labours of the Royal Geographical Society, during the year* 1836-7. By the Secretary. Read at the Anniversary Meeting.

Seven years have now elapsed since the foundation of the Geographical Society of London,* and at the close of its first septennial period we may perhaps be permitted to recall the chief geographical discoveries that have marked each year of its course, before proceeding to the more general subject of the progress of geography during the past year.

The first year of the Society's existence was signalized by the solution of that remarkable geographical problem, which had already caused the sacrifice of many valuable lives, and which may be characterized as the greatest geographical discovery since that of New Holland—namely, the course and termination of the river

* Yet be it remembered that the African Association had existed since the year 1788—and the Palestine Association since the year 1804, and these were purely geographical societies, and many important discoveries were made under their auspices.

Niger, or Quorra, by the brothers Richard and John Lander, who navigated its stream from Yaoori, in lat. 11° north, to the sea in the Bight of Benin—a distance of 600 geographical miles.

The year 1832 was remarkable for discoveries in the Antarctic Ocean—effected by Mr. Biscoe, R.N., who, commanding the brig 'Tula,' in the employ of those spirited merchants Messrs. Enderby, of London, succeeded in reaching a high southern latitude, where he discovered two considerable tracts of land—viz. that justly named Enderby's Land, in long. 47° E., and Graham's Land, with Adelaide Island, &c. in 67° W.—all nearly on the Antarctic circle.

In 1833 we had to turn our eyes to the opposite pole, where Ross, and his gallant band of British sailors, had passed three years amidst the ice of the Arctic Seas—and then unexpectedly returned to their country, bringing accounts of their close approach to the magnetic pole, and of the discovery of a large tract of hitherto unknown coast-line of the peninsula of Boothia,—and not less in importance, a proof of the moral courage displayed by this band of sailors, under circumstances of privation and hardship almost unexampled in the annals of discovery.

The year 1834 was marked by a successful and important journey across central Asia, by Lieutenant A. Burnes, E.I.C.; during which he obtained much information on his route from Cabul, across the Indian Caucasus, to the ancient cities of Balkh and Bokhara, and added considerably to our former knowledge of the course of the river Oxus, and generally to the physical and political geography of Upper Asia.

In 1835 we had again to revert to North America and the Arctic Ocean, where our gallant countryman Back discovered and followed to the sea the great river which now justly bears his name, tracing its course in a north-east direction, a distance of 600 miles from its source to the ocean; and there, on the shores of the Frozen Sea, obtaining such evidences of the great probability of a communication by water along the northern coast of America, in the parallel of 69° or 70°, that the government has again entrusted to him the command of an expedition which we sincerely trust may, by tracing the northern shore of America, set the seal to Arctic discovery; and thus reward the enlightened perseverance of the British government, and the courage and enterprize of its servants.

Such are the discoveries for which the Royal Premiums, graciously placed by his Majesty at the disposal of the Society, have successively been awarded by the council.

From such high and animating ground of discovery let us descend to the more humble, yet not unimportant details of the progress of geography during the past year. And fully aware of

the difficulty of the task, and conscious how imperfect such a sketch must of necessity be, it is undertaken with the hope that by endeavouring to state what has been done, and briefly pointing out what remains to do, it may be the means of rousing others to join in reaping the ample harvest which is yet offered to those who take an interest in the study of some of the many branches of geography.

EUROPE.

Civilized Europe, it might be imagined, at first sight, would offer no field for geographical research; and, in fact, a rapid journey over the greater part of Europe could not add much to our knowledge of its physical geography; but when we search for rigorous astronomical and statistical observation—for correct topographical detail—for a precise delineation of its physical features—for an exact outline of its coasts, and the depth of water in its various seas and channels—we search almost in vain; yet much has lately been done towards attaining such a knowledge of this part of the earth's surface as the advanced state of science and civilization imperatively demands.

British Isles.—It is on this principle that the national map of England, known by the name of the 'Ordnance Map,' (begun in 1796,) is at present being executed, under the zealous superintendence of Captain Colby, R.E., and engraved on the scale of an inch to a statute mile, or $\frac{1}{63000}$ of the natural scale: two sheets have been added to this survey during the past year, and sixty-nine sheets are now published, comprising all the southern and midland counties; four or five more sheets may shortly be expected;—while the geological examination of the country, under the able direction of Mr. de la Beche, now combined with the topographical survey, will greatly enhance the value of the maps.

A cadastral survey of the country, on the scale of $\frac{1}{2376}$, or nearly 27 inches to a mile, to show the boundaries of parishes, &c. has been proposed, but it appears not to be considered necessary.

No national map of Scotland exists, but the points of the great triangulation are established, and the private munificence of individuals has filled in the detail of some of the counties—Sutherlandshire, for instance, at the expense of the Duke of Sutherland, &c. A small general map, on the scale of 8 inches to a degree, by Mr. John Arrowsmith, almost finished, combines all that is accurately known of Scotland. The geological map, by Dr. M'Culloch, is likewise published. The detail of the coast-line is proceeding, under the superintendence of the hydrographer; and also an excellent map of the Shetland Isles, on the scale of half an inch to a mile, has been completed during the

past year by Mr. Thomas, R.N., who has devoted some years to its execution.

The recent survey of Ireland, called the 'Towland Survey,' is proceeding rapidly. This truly national work, which does honour to the enlightened legislature that ordered it, and to the engineer officers who carry it into execution, is based on a grand triangulation, one side of which, connecting Ireland with England, is 108 miles in length; another, 101 miles, 93 miles, &c. Its detailed operations are completed with the most minute accuracy, on the scale of 6 inches to a statute mile, or $\frac{1}{10560}$ of the natural dimensions; exhibiting all the boundaries, distinction of barren and cultivated land, levels, &c.—in short, everything of practical utility; so much so, that a line of rail-road or canal might be, and has been, projected,* on the data supplied by it, without any fresh survey—which could not, it is believed, be effected with the existing maps in any other country in the world.

The maps of ten counties, comprising 560 sheets, are published, and the work advances rapidly. Combined with this map a series of memoirs is publishing, which will make it as complete as can be expected in a work of the kind. Would that such a work were possessed by, or in progress in, every nation in Europe!

In concert with the land-survey the hydrographic department, under the zealous and enlightened superintendence of Captain Beaufort, is extremely active. Parts of the east and west coasts of England, the Irish Channel, the east coast of Scotland, the coast of Wales, and the northern coast of Ireland, have been accurately examined, and are still in progress. Added to this, a minute and beautiful chart of the North Sea, executing by Captain Hewett, and showing, with the greatest accuracy, all the undulating features of the wide but shallow valley—in no part exceeding 100 yards in depth—which separates our island from Holland and Europe, are gratifying proofs of the activity displayed by the government in the advancement of physical geography.

At length we may venture to boast of a work, worthy of the subject, on the *Physical and Political Geography of the British Islands*, forming part of the Library of Useful Knowledge, in which the physical features which mark the true face of the country are traced with a master's hand.

On general geography, with the exception of some articles in the Encyclopædias, and especially in the Penny Cyclopædia, no work has been published in England during the past year;† yet

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* The projected railway between Derry and Enniskillen; also in the improvement of the harbour at Belfast.

† The valuable researches of Mr. Whewell and Mr. Lubbock, on the subject of tides, form an honourable exception; as do also the useful printed Tide Tables, published by the Hydrographic Office at the Admiralty.

is the harvest so thoroughly gathered that nothing is left for the gleaner? Has the subject of the geographical distribution of man, of animals, and of plants* met with attention? Has ethnography, or the classification of mankind according to language—or its classification according to religions, been studied? Is there a traveller's manual, or a table of positions, or a general gazetteer, or dictionary of geography, worthy of the name, in our language? † It is to be feared we ask in vain.

France.—The great topographical map of France, to be completed in 258 sheets, under the direction of General Pelet, of the Dépôt de la Guerre, has issued 12 sheets during the past year, making 48 sheets already published.

The publication of this admirable work began in 1833; it is executed with great care, on the scale of $\frac{1}{80,000}$, or about $\frac{9}{10}$ of an inch to a geographical mile, and is accompanied by a geometrical description, by Colonels Puissant and Corabeuf, reciting all the scientific labours on which the survey is based,—a very proper accompaniment to the national work. A map of Guienne, on the scale of $\frac{1}{43,200}$, or $1\frac{7}{10}$ of an inch to a geographical mile, is also publishing by the Dépôt de la Guerre: 50 sheets have appeared, and it is to be completed in 54 sheets. Conjointly with this survey, an accurate examination of the coasts of France is proceeding under the direction of Admiral Hamelin, of the Dépôt de la Marine, seconded by the zeal of M. Beautemps Beaupré, and M. Daussy; and some valuable charts and plans have been published by the Dépôt during the past year, in addition to that excellent work, the Pilote François.

L'Atlas physique, politique, et historique de la France, which forms the third part of a Course of Comparative Geography, by M. Denaix, proceeds fast to its completion.

Belgium.—Under the spirited direction of a private individual, M. Ph. Vander-Maelen, at Brussels, whose topographical and statistical labours in his own country deserve the highest praise, two new works are just completed; one, a geometrical plan of Brussels, by M. Craan, in 4 sheets, on the scale of $\frac{1}{2500}$, or 29 inches to a geographical mile; the other, a map of the environs of Brussels, by Professor Perkins, in 9 sheets, from the cadastral survey, on the scale of $\frac{1}{10,000}$, or rather more than 7 inches to a geographical mile; which may be added to the numerous works already published at this splendid geographical establishment.

Sweden and Norway.—In addition to Colonel Forsell's map

* Mr. Watson's Sketch of Geography of Plants is an exception.

† It is a singular fact, that in the Index to the Reports of the British Association, and in that to the Magazine of Popular Science, the word Geography is not to be found; or if perchance found in the former, it refers to nothing.

of Sweden, in 8 sheets, his excellent work on the statistics of the country has added much to our knowledge of this kingdom.

Iceland.—A French Commission, composed of several scientific men, headed by M. Gaimard, has this year visited Iceland, has thoroughly examined the country, and has brought home a large collection in natural history. The results of the expedition in detail may shortly be expected.

Hanover and Brunswick.—The topographical map of these countries, in 67 sheets, by Papen, has issued 10 sheets during the past year. Also the various maps in course of publication in the different states of Germany have each added this year a few sheets to their number.

Saxony.—The map of Saxony, by Schlieben, has furnished 7 sheets, and the Statistical Society at Dresden is active in collecting and diffusing topographical as well as statistical information relating to the country.

Prussia.—Three sheets of the Government map of Prussia have been issued; and two of that by Engelhardt. A general list of the maps and geographical works in course of publication will be found at the end of the last volume of the Society's Journal, and which will be continued. The catalogue would be too long to enumerate them here; yet if those only were mentioned that are based upon strict principles, the number, it is feared, would be but small. The subject of the orthography of names of places demands serious attention; and this may be more especially remarked in maps of Asia and Africa. If the Geographical Societies of Berlin, of Paris, and of London could be induced to adopt some general standard for orthography of Arabic, Turkish, Persian, &c. names, perhaps all geographers, even if they might not fully approve of it, would, for utility's sake, adopt it.

Tuscany.—In addition to Padre Inghirami's excellent map, and Zuccagni Orlandini's Atlas of this state, Repetti is publishing a geographical dictionary of the Grand Duchy, which has reached the letter L; thus, perhaps, no state in Europe will be more correctly described.

Greece.—Besides the admirable map of the Morea, made under the immediate superintendence of Captain Peytier and M. Puillon Boblaye, and published on the scale of $\frac{1}{200,000}$, or about 3 miles to an inch, the French have just completed a survey of 800 square leagues of Northern Greece, comprising Eubœa, Attica, Bœotia, Phocis, and Locris.* The disturbed state of the country prevented their proceeding with Acarnania and Etolia, about 600 square leagues more, which still remain unexamined, except the sea-coast of the former, which was sur-

* See Bulletin de la Société de Géographie, Dec. 1836, and March, 1837.

veyed by Mr. Cooling, R. N., in 1830. We have also the whole northern frontier line from Arta to Volo, a distance of 137 miles, laid down by the Commissioners for fixing the boundaries.* This, combined with the admirable travels in Northern Greece, by Colonel Leake, just published, has done much towards removing our ignorance of this highly interesting country.

Turkey.—The southern shores of Turkey in Europe have been recently surveyed by Captain Copeland, R.N., who, commencing at the Island of Cerigo, has carried the examination round to the entrance of the Dardanelles; he has also determined the height of many of the principal mountains, as Olympus, Ossa, Pelion, Athos, † &c. The charts of this survey are now publishing by the Hydrographic Office, on the scale of 5 miles to an inch. Of the interior of this fine country we know very little, except an account of its statistics and its resources by Mr. Urquhart; and we have the testimony of the excellent geologist, M. Ami Boué, who has lately examined the structure and direction of the mountain ranges, "that even the best maps of this country are extraordinarily incorrect."‡

Now that there is no difficulty in travelling in Turkey, and that nothing but a little personal discomfort need be feared, it may be hoped some unoccupied tourist may find a more worthy subject than to record the whimsical adventures of a voyage down the Danube, and may be induced to visit a part of Europe where there are yet discoveries to be made; namely, sources of rivers, mountain-ranges, extensive plains, &c., as indicated by M. Boué, and of which we know nothing.

Archipelago.—Many of the Greek and Turkish islands have been accurately examined during the late survey, which from the Dardanelles has extended along the shores of Asia Minor to Ephesus—charts of which, with the islands of Lemnos, Samothraki, Samos, &c., are completed, though not yet published. In Candia, the ancient Crete, we have the recent travels by Mr. Pashley, in which the author, besides illustrating with great learning the classical and antiquarian interest of his subject, has obtained much useful statistical information respecting the present state and capabilities of this beautiful island.

Russia.—The new map of this vast empire, in 59 sheets, by the Dépôt-topographique, on the scale of $\frac{1}{420000}$, comprises part of the information collected by Herr Adolph Erman, in his important journey from St. Petersburg to Moskow, and by Kazan and Perm, across the Ural Mountains to Tobolsk, and along the Obi to Obdorsk. The first volume of the personal narrative of

* See Memoir by Colonel Baker, in Journal R. G. S., vol. vii. p. 76.
† See Journal R. G. S., vol. vii. p. 61.
‡ See Bulletin de la Société de Géographie, Oct. 1836.

this journey is filled with geographical details on this little known country, as far as the mouth of the river Obi; also with information regarding the mines in the Ural, the hydrography of the Wolga, &c. &c.

A paper "On the Varieties of Climate and Productions in the Russian Empire," published in the Agricultural Gazette, at St. Petersburg, and translated into the Quarterly Journal of Agriculture,* contains an able summary of this subject, and much useful information.

The results of a chronometric expedition round the Baltic, by the Russian General Schubert, in 1833, have been published during the past year, and kindly transmitted to the Geographical Society by M. Kupffer.† They give the relative position of seventy-seven important points.

Traversing 900 miles of latitude, we reach the spot on the shores of the Black Sea, where the new series of observations is to commence, to determine the difference of level between it and the Caspian. The direction of this undertaking is confided to Messrs. G. Fuss, Sabler, and Savitch; and the line selected is from Novo Tcherkask, near the mouth of the river Don, to Stavropol, and thence to Kisliar on the Caspian, a distance in a direct line of about 390 geographical miles, on a general bearing of north-west and south-east. Thus there is every probability of the long-contested question in physical geography of the depression of the Caspian Sea being finally set at rest.

Caucasia.—On the Caucasian provinces, especially interesting at this day, we have a notice in the work of M. Charles Belanger's "Voyages aux Indes Orientales," &c.; also in M. de Marigny's "Three Voyages," and Herr Nordmann's scientific tour in the Black Sea. The Academy has also published during the last year M. Kupffer's observations during his travels in the Caucasus, and the continuation of the work of Marshal Biobertein on the flora of that country: and the Academy of St. Petersburg has instructed M. Sjægren to proceed to Caucasia, in order to make himself acquainted with the language and customs of the Ossetes, one of the six classes of the nations now inhabiting the Caucasian provinces.

From Berlin we learn that M. Dubois has submitted to the Geographical Society there the maps and drawings made by him during some years' residence in the Caucasus; and Herr E. Eichwald, at Stuttgard, has also lately published the account of his journeys to Caucasia and to the Caspian Sea.

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* See Quarterly Journal, No. 32.
† See Journal R. G. S., vol. vi. p. 413.

ASIA.

A glance at the map of this vast country will show at once that here is ample field for geographical discovery. From the icy ocean to the equator—from Syria to Japan, every journey of any extent must be over ground with which we are but imperfectly acquainted,—and this very ignorance should be an additional stimulus to prosecute research to every European whose lot may be cast in this portion of the globe.

In briefly recapitulating the principal works which have contributed to the improvement of the geography of Asia, we would first point attention to the admirable work "Erdkunde von Asien," by Professor Ritter at Berlin, which has now reached the second part of the third volume, and thus completes the description of Hindustán and of Eastern Asia; and, secondly, to the Atlas von Asien, by Dr. H. Berghaus, in which, besides the maps of the countries, he has discussed all the elements employed in their construction. The past year has produced six new maps, namely, Syria, Arabia, and Egypt, Assam, and the Chinese Coast.

Siberia.—Commencing to the north, we must again take up the route of Herr Adolph Erman from the Ural, thence by Tobolsk along the river Obi, to Obdorsk, near the Arctic Circle: returning to Tobolsk, he proceeded to Irkutzk, and visited Kiakhta and the country south of the Baikal Lake, then to Yakuzk, and across the Aldan Mountains to Okotzk, thence by sea to Kamskatka, and to the island of Sitka. The results of this journey, parts of which only are yet published, are highly important to physical geography. During the same period, Captain Lutké, commanding the Séniavine, had examined the coasts of Kamskatka to the north of Avatchka Bay, and several islands in Behring's Sea. Baron Wrangel, too, lately returned to Europe from his command at Sitka, has doubtless brought home some geographical information from that distant quarter, which, it is hoped, may be made public; all we know is, that he has proved the non-existence of some of the pretended discoveries by the American whalers, and has fixed the position of some points in the Aleutian Isles. From the introduction to Captain Lutké's Voyage, we learn that during the last twenty years not less than twelve Russian ships of war have made voyages round the world, two only of which have been published previous to the present, namely, Bellingshausen, in 1819-21, and Kotzebue, in 1823-26.

The result of the levelling by Mr. George Fuss, along the shores of the Lake Baikal, has been published in the Memoirs of the Academy of Sciences at St. Petersburg.

Japan.—Dr. Ph. von Siebold's Archief, &c., or Description of Japan, being the results of six years' residence there, from 1824 to 1830, has reached the seventh number. In the mean time, we have Herinneringen uit Japan, by Heer Heindrick Doeff, published at Haarlem,—the only remains of a long residence in that empire, the fruits of which were lost by shipwreck.

Central Asia.—The map of Central Asia, in 4 sheets, on the scale of nearly 2 inches to a degree, by Klaproth, has, since the death of that eminent orientalist at Paris, remained unpublished. It is compiled from the great Chinese map and other sources, and contains *some* of the author's own routes in Central Asia.

The Asiatic Society of Bengal has printed a memoir on Chinese Tartary, and on Khoten by Mr. Wathen; and a geographical and political notice on Iskardoh in Little Tibet, compiled by Captain Wade, from information obtained from an envoy of Achmed Scháh.

The interesting journey in India of M. Jacquemont has reached its eighteenth number; and we may shortly expect the travels of Moorcroft and Trebeck, with a map, combining all the latest information from the most authentic sources.

Kashmír.—Baron Hügel, just returned to Europe, after an absence of six years in the East, has supplied a valuable notice on the present state of the Valley of Kashmír, and a more correct map of the Panjáb, and the various passes through the Himálaya Mountains than we before possessed.* We look with interest for the remainder of his travels, which, from the specimen kindly given to the Geographical Society, must contain valuable information.

China.—Of this country, to which it is so difficult to obtain access, we have a general description, as also of its inhabitants, by Mr. Davis, many years a resident at Canton, and well acquainted with the language and literature of the Celestial Empire.

It is probable that we must look to our missionaries for a better knowledge of this country. The patient perseverance, combined with the truly Christian zeal with which they pursue their high calling, may eventually open a way into an empire that seems shut to any other attempts.

It is from the journal of a missionary, M. Bruguière, appointed chief of the Roman Catholic mission in Corea, that we have the latest accounts of China and Chinese Tartary. From Macao, M. Bruguière went to Fougan, to Nanking, passed the Great Wall into Tartary, and resided some time at Sivang; thence he reached the frontiers of Corea, where he fell a victim to fatigue and privation.†

* See Journal R. G. S., p. 343.

† See Annales de la Propagation de la Foi, No. 50.

Malacca.—A slight notice of a part of this peninsula has been communicated to the Asiatic Society of Bengal by Lieut. Newbold, chiefly concerning the political relations of the native states.

Borneo.—Of this little-known island an interesting paper will be found in the Journal of the Asiatic Society of London, by Mr. G. W. Earl, who has also given an account of his voyages in the Asiatic Archipelago, in a volume just published. We have, too, the results of Heer Oliver's Voyages to the Moluccas, and to Makassar in the Celebes, in 1824, lately published at Rotterdam. At Paris, also, M. de Rienzi is publishing an account of some years spent in these Eastern Seas.

New Guinea.—At the south-western extremity of this island the Dutch have proved that Cape Walsh is situated on an island, about eighty miles broad; thus one atom of information is added to the balance against our great ignorance of even the shores of this vast island.

India.—Returning westward, we come to the British possessions in India; and here, at least, we are upon known ground. The measurement of the great meridional arc, resting upon eight bases, and extending from Cape Comorin, in the parallel of 8°, to the foot of the Himmálaya, in 30° north latitude, a distance of 1320 geographical miles, has, during the last year, been brought to a close. This arc has been connected by lateral series of triangles with Calcutta, Bombay, Madras, and Benares: the whole of the tract south of the river Khrishnah, in the parallel of 16° nearly, with the exception of Dindigul and part of Nellore, has been accurately surveyed: north of that line, to the borders of Hindustán, only Kandeish and part of the Hydrabad territory are still to be examined. Many of the maps of this survey, on the scale of 4 inches to a mile, are already published, and the rest are in course of publication. This work does honour to the enlightened views of the East India Company, who instituted it, and to the zeal and energy of their officers who have carried it into execution.

Sind.—Of Sind we have a notice by Captain A. Burnes, who has again recently left Bombay on a mission to Cábul; and we have a good earnest in what he has already done that he will lose no opportunity of acquiring further information.

Arabia.—The shores of the Persian Gulf have been already surveyed, and, with the excellent charts of the Red Sea just completed by the officers of the East India Company's service, have made us fully acquainted with the east and west coasts of Arabia; from the Straits of Bab el Mandel, to the eastward of Makullah, the southern shore has also been surveyed. Of the interior Lieutenant Wellsted, of the Indian Navy, has given us some account;—first, in a journey from the south coast to some remarkable ruins, about seventy miles in the interior of the eastern part of

Yemen; secondly, by a very important journey of seven hundred miles in the interior of the province of 'Omán, under the dominion of the Imâm of Muskat.*

Berghaus, also, has published a map of Arabia during the past year.

Euphrates.—This river has been explored, (thanks to the liberality of the British government,) and the practicability of its navigation, with proper vessels, from Bír to the Persian Gulf—a distance, including its windings, of nearly 1000 miles—has been fully demonstrated by the zeal, and energy, and perseverance of Colonel Chesney, who, in spite of obstacles of no ordinary character, has accomplished his difficult task. The geographical information obtained, which must be very important, has not yet been made public.

On a neighbouring river, the Tigris, we have the accurate observations of the lamented Mr. Rich, (too early taken away from his sphere of usefulness); also an account of his journey into Kurdistán, his residence at Baghdad, and on the site of the ancient Nineveh; which have been made public during the past year.

Syria.—Here we must again cite Berghaus' map, as the best we have yet seen of this country.† Mr. Barker has contributed an account of a journey to the source of the river Orontes, and of the passage of Lebanon; and we hear that a spirited young Irishman, Mr. George Moore, instead of loitering in fashionable pilgrimage along the beaten paths of Palestine, has actually devoted the past year to a minute geographic examination of the Dead Sea and its shores.

We hope the time is come that some geographer will take in hand a map of this region, profiting by the data that would be willingly supplied by the numerous travellers that have journeyed over every part of both Syria and Palestine, and endeavour to complete a map worthy of a country which must ever possess a higher interest than any other on the surface of the globe.

Asia Minor.—Still proceeding westward, we come to the journeys of MM. Callier and Texier, in Asia Minor, of both of which we have yet only very brief accounts. Our own countrymen, Mr. Brant, in 1835, and more lately Mr. W. I. Hamilton, in 1836, have given us routes throughout Anatolia and Armenia, from the shores of the Mediterranean to the frontier of Persia. The former has contributed a new route by the Russian frontier; the latter several routes, over less frequented parts of the country,

* See Journal of the Royal Geographical Society, vol. vii. part i.

† We had hoped ere this to have profited by the observations of M. Callier, who three years since travelled through this country, but they seem not to have been yet made public.

throughout which he has paid great attention to its geology and its physical geography.

The survey of the western shore of Anatolia, to unite with that of Karamania, by Captain Beaufort, is now in progress, under the direction of Lieutenant Graves, R.N., and will thus complete the coast-line of the more western portion of Asia.

AFRICA.

Northern Africa.—In this wide field for discovery accurate geographical investigation has advanced but a little way beyond the coasts within the last year; and it is to be feared that the recent calamitous death of our countryman,—a loss which we, in common with every admirer of enterprise, deplore,—may tend to check its progress for some time to come. Young, zealous, and enthusiastic in the cause of discovery, the traveller had surmounted all the difficulties opposed to his advance in Marocco, in Sús, in Wadi Nún, and had even traversed half the desert towards Tumbúktú, when he was barbarously murdered by the faithless Arabs: and the name of Davidson must now be recorded with those of Hornemann, Park, Ledyard, Burckhardt, Laing, and Lander, as some of the most eminent among our countrymen who have sacrificed their lives in the cause of African discovery.

Should the traveller's papers be recovered, we may expect to find in them a detailed account of the country round Wadi Nún, and observations calculated to determine the western route from Marocco to Tumbúktú more accurately than has hitherto been done. All that we now know of his routes is gathered from his letters to H. R. H. the Duke of Sussex, and to his family, which have been promptly communicated to the Geographical Society, and will be found in the seventh volume of its Journal.

Abú Bekr, the companion of Mr. Davidson, who is supposed to have continued his journey to Tumbúktú, has been sent for by the sheikh of Wadi Nún, and if he escape the perils of the deserts, will probably return to England. He is quite capable of giving an instructive and accurate account of the country through which he passes; his retentive memory and his honesty meriting the utmost confidence. It may be here observed that Abú Bekr's description of the route from Jenné to Cape Coast, collected with great care by Mr. Renouard, and inserted in the sixth volume of the Journal of the Royal Geographical Society, deserves much attention, as it points out a short road to the interior which had never yet been thought of, and which, so long as we possess the friendship of the King of Ashantí, seems to offer considerable advantages.

In continuation of the former labours of Captains Belcher and Skyring, R.N., Lieutenant Arlett has surveyed and laid down, on

the scale of an inch to a mile, the western coast of Africa, from Cape Spartel to Cape Bajador; has measured the height of many of the mountains of the lesser Atlas, and has expunged from our charts of these shores many imaginary dangers. He commenced a survey of the Canary Islands, which that able and experienced officer, Captain Vidal, will complete in the intervals afforded him by the Harmattan season, which periodically interrupts his trying and exhausting, but highly important labours along the Gold Coast from Cape Palmas to Corrisco.

Algiers.—For the improvement of the geography of Algiers we naturally look to France, and a map of the territory comprehended within the French military operations is said to be now in a forward state. The surveys of the Bays of Algiers and Bona have been completed; also the coast-line, from the former to the frontier of Marocco, under MM. Bérard and Dortet de Tessan, and published at the Dépôt de la Marine. The continuation of the survey as far as Cape Spartel is about to be executed.

Tunis and Tripoli.—No positive accessions to topography have been made here; but we may notice the maps of these countries, published by the Society for the Diffusion of Useful Knowledge, as the most correct in point of orthography of any hitherto issued.

But we cannot quit the subject of Northern Africa without bearing testimony to the value of a work, bearing the unpretending title of 'Etudes de Géographie Critique sur une partie de l'Afrique Septentrionale,' by M. D'Avezac, late Secretary-General to the Geographical Society of Paris, accompanied by a newly-constructed framework of a map, in which the author has laid down the various itineraries furnished by different travellers, and discussed their merits;—a good example in critical geography, which we would gladly see followed for other parts of the world.* M. D'Avezac has also published an 'Esquisse de l'Afrique,'—a programme only, we believe, to a larger work on that country.

Egypt.—We still look anxiously for the map of this country by Mr. Wilkinson, in addition to his splendid work on the topography of Thebes. Of the manners and customs of the modern Egyptians, we have a graphic description from the pen of Mr. Lane, and from M. Jomard, a 'Coup d'œil impartial sur l'état

* In a brief notice of this work, in Volume vi. of the Journal of the Royal Geographical Society, it was mentioned in a note that there appeared some omissions and inaccuracies in the map which accompanies it. The author has since, in a letter evincing great knowledge of the geography of Northern Africa, shown that he was fully borne out by the authorities he had consulted in compiling his map. Whether fresh information procured from travellers may confirm these authorities remains to be proved.

présent de l'Egypte, &c.' The charts of the Red Sea, from a survey made by the officers of the Indian navy, constitute a valuable addition to our knowledge of the eastern side of the African Continent. They have pointed out exactly the ruins of Berenice, and done much towards proving the general accuracy of Bruce's positions: on both these subjects Lieutenant Wellsted, of the Indian navy, has contributed an interesting paper to the Journal of the Geographical Society.

Abyssinia.—Dr. Rüppel has returned to Europe, and we may shortly expect the results of his late journeys in this country. In the mean time, two French travellers, MM. Tamisier and Combes, have returned to Marseille, after having penetrated, it is said, as far south as Shoa, in 10° north latitude, some distance to the southward of the extreme point reached by M. Caillaud. Unfortunately these travellers were unprovided with instruments, and little can therefore be expected from the narrative of their travels, besides the description of the half-civilized tribes with whom they had intercourse. Among these were the Boren, Galla, and some Mohammedan tribes of the same nation, who stopped the progress of the travellers, and having plundered them, compelled them to retrace their steps.

The survey of the north-eastern extreme of Africa is still carrying forward to Cape Gardafui by the officers of the Indian navy, who have also completed an examination of the Island of Socotra, of which a detailed description has been communicated to the Society by Lieutenant Wellsted, one of the officers employed.

Western Africa.—Traversing, in imagination only, the whole breadth of the continent, in this parallel, we reach the Bight of Benin, where the survey of the Gold Coast, before alluded to, is now carrying on.

At length we have the gratification to announce the publication of Captain Allen's excellent chart of the Quorra, that river which, under the name of Nigir, has excited so much interest, given birth to so much learned speculation, and cost this country so many lives. The chart extends upwards from the sea about four hundred miles, to the large town of Rabbá, marking the depth of water and the features of the banks, and containing a very picturesque view of the point where the Tchadda pours in its collateral stream. One of the Liverpool steamers which so generously conveyed Captain Allen up the river, in order to examine it, has remained at Fernando Po, and in her Mr. Becroft has again ascended the Quorra, and also the old Calabar river of our maps, which he believes to be a branch of the deltoidal mouth of the Quorra. This seems to require confirmation.

South Africa.—Here the spirit of exploration has been latterly

very active. The roving habits acquired by the boors near the Karroo, the commercial relations of the colony with the nations of the interior, and the nature of the country, all tend to throw the enterprise of the colonists into a channel favourable to geographical discovery. Dr. Andrew Smith, the leader of the expedition which left Cape Town on discovery two years since, has recently arrived in London, bringing with him a large collection in various departments of natural history. He has visited the sources of the Caledon and the Maputa; has ascended the heights of the Caffrarian Mountains, and advanced as far as the southern tropic in the tracks of the traders. As yet, however, there is but little known of the geographical results of his journey, which cannot fail to be highly important, as his party was well provided with instruments. In the spring of last year two traders from the colony, Messrs. Mehem and Jones, reached Delagoa Bay with loaded waggons, being the first to beat a path which we dare say will soon be much frequented. Captain Gardner, while seeking a pass practicable for waggons through the Quathlamba Mountains from Natal to the Orange River, arrived within a few miles of the sources of this great stream. It is to be lamented that his hasty search proved unsuccessful. The country round and immediately north of the sources of the Orange River has been narrowly examined by the French Protestant Missionaries.

On the western coast the Wesleyan Missionaries have resumed their labours in Great Namaqua; and it is to them that we must look for a better knowledge of the natives, and for the spread of civilization and Christianity, the most worthy object of geographical discovery.

In this direction also Captain Alexander departed in September last from Cape Town, on his way to the Dámaras country and to Walvisch Bay, which he hoped to reach by last March. His route has been by Clan William, and the Kamiesberg, across the Orange River; and by the latest accounts, dated January 1, 1837, he was at Africaaner's Kraal, in latitude 28° south, longitude about 19° east. All his party well, and only waiting for a few showers of rain to continue his journey to the northward.

Mozambique.—M. Xavier Botelho, many years resident in the Portuguese possessions on this coast, has lately published a statistical notice of its establishments; for an account of which the Edinburgh Review for November last may be consulted with advantage.

Madagascar.—Of this important island we are still very ignorant; nor could any information be gleaned from the natives who have lately passed some weeks in England; yet that four out of six spoke and wrote English with facility, is a testimony to the

labours of the Missionaries in this country. We hope ere long to have a full account of a residence of some years in the capital, Thanaan-arrive, from a Missionary who is intimately acquainted with the language, and has taken a leading part in communicating to the natives, as far as practicable, some of the blessings of civilization.

AMERICA.

North America.—Traversing the Atlantic to the shores of America, we naturally follow the course of our gallant countryman Back, in his former voyage, from the wide expanse of the Great Slave Lake, for 600 miles down the river which now most appropriately bears his name, to the shores of the Arctic Ocean, and there watch him carefully collecting evidences in the set of the current—the direction of the ice—and the character of the drift wood—for the great probability of a water communication in or about the parallels of 69° or 70°. In order to supply the few remaining links in the chain of discovery which the efforts of Parry, Franklin, Beechey, and the Rosses had thrown round the northern coast of America, his Majesty's Government, approving of the recommendation of the Geographical Society, again dispatched Captain Back, in his Majesty's ship Terror, in June last, for Repulse Bay, or Wager Inlet—thence to cross the supposed isthmus which separates the two seas, and to continue along-shore to the westward, in his boats; and thus, we confidently trust, by determining the northern limits and configuration of the American Continent, to complete the stupendous discoveries of the great Columbus.

Further to the westward the Hudson's Bay Company, in pursuing their avocations over an unknown country, are annually making fresh discoveries; and at this moment some of their servants are exploring a track from the Great Slave Lake to Port Turnagain, with the hope of tracing the 220 miles of coast that are yet unknown between that point and Captain James Ross's farthest.

Greenland.—Captain James Ross, R.N., in his recent voyage in search of the missing whalers, has obtained some new information relative to the west coast; and the translation of Graah's Voyage to Greenland, just published by the Geographical Society, will enable the English reader to judge of the probabilities that may yet remain of discovering the supposed lost colonies on the east coast of Greenland.

Canada.—An arduous survey of the great river St. Lawrence, by Captain Bayfield, R.N., under the direction of the Hydrographic Office, has for several years been in progress; and so valuable are his charts acknowledged to be, that the pilots of Quebec petitioned government for their immediate publication.

They are now published, on the scale of an inch to a mile, for the upper part of the river—for the lower part, the scale is an inch to two miles and a half. To navigators frequenting the St. Lawrence these charts will prove an invaluable boon.

United States.—A large map of the United States, in twenty-four sheets, on the scale of twelve inches to a degree, compiled from general surveys by Mr. D. H. Burr, Topographer to the Congress, is now engraving in London, by Mr. John Arrowsmith, and will shortly be in course of publication in the United States; but preparations have been long in progress for an elaborate triangulation of the whole union—instruments of the most refined construction have been gradually provided—and a short trial, comprising about eighty miles along the coast, has been already made under the directions of Mr. Hassler, whose well-known talents as a mathematician and an observer give more than promise that this splendid undertaking will equal anything yet executed in the old continent. How singular that a country which has made such gigantic strides in arts and in science, in such a short period, should not yet have established a National Observatory! But Congress, we learn with much satisfaction, are now about to wipe away this just reproach; and we can also congratulate the scientific world on the steps which our own government is now taking to erect an observatory at Toronto, the capital of Upper Canada.

Mexico.—The great interest attached to the extraordinary remains discovered in this country have lately elicited two memoirs on the subject; one from the pen of Captain Vetch, R.E., who spent many years there—the other by Dr. Von Martius, inserted in the Transactions of the Academy of Sciences at Munich: the latter seems to be of opinion that a nation of Toltecs never existed, but that it was a name applied to the Astecs, who erected the pyramids of Cholula, &c., Toltec, Dr. Von Martius says, signifying 'builder.'

Herr Carl Nebel, of Hamburg, has just completed the twelve Numbers, containing his voyage to Mexico, beautifully illustrated; and now that there is no longer any difficulty in travelling there it may be hoped that some of our many wandering countrymen will turn their steps to Mexico, where are yet many discoveries to be made, and particularly with regard to that interesting subject, the migration of nations,—and thus complete the work that Humboldt has so well begun.

Central America.—The eastern shores of this country have just been accurately surveyed by Captain Owen, R.N. Commencing at Cape Catoche, the north-eastern point of Yucatan, the survey has been continued down the coast of Honduras, and along the Poyais shore, to Cape Gracias a Dios, and from thence to the

southward as far as the Rio San Juan. But Captain Owen's skill and resources have not been confined to that shore;—they have new-modelled the charts of that most intricate group, the Bahama Isles; he has corrected numerous errors in those of Jamaica, Haïti, and Cuba, and after minutely examining the Bank of Demerara, he surveyed that river for 200 miles from its mouth. On the western shores a survey is carrying on under Captain Belcher, R.N., whose present ground is between the Gulfs of Panama and California; but he will ultimately unite the surveys of Captain Fitz Roy to the discoveries of Vancouver and Beechey; and thus will the British government present to the mariner and geographer the noble gift of a correct and uniform representation of the whole western coast of America from Cape Horn to Behring's Straits, comprising a space of upwards of 9000 miles. Of the interior we have some routes of travellers, &c.; and a general memoir on the country, by Colonel Galindo, will be found in the Royal Geographical Society's Journal, vol. vi.

The ruins of the nameless city, or cities, near Palenque, as also of Itzalan, have been beautifully drawn by Mr. Waldeck, and are now, we are informed, in course of publication at Paris.

West Indies.—The survey of this archipelago of islands, cays, and shoals, is continued under the direction of the Hydrographic Office, and executed by Lieutenant Barnet, R.N., whose indefatigable labours on the vast and dangerous cays near the Mosquito Coast have entitled him to the gratitude of every West Indian navigator. Much useful information will also be found in Sir Andrew Halliday's lately published work on the natural and physical history of these islands.

South America.—Before proceeding further with a country that recalls to us at every step that excellent traveller Baron Humboldt, we must notice his valuable work entitled "Examen Critique de la Géographie du nouveau Continent, aux 15me et 16me siècles,"—in which the author thoroughly examines all the claims of pretenders to the discovery of the new world—points out when the name of America was first applied to it—and fully exposes the absurdity of the pretensions, by means of which the prenomen of Vespucius has become unalterably affixed to the largest portion of the globe.

Brazil.—Nor would it be right to omit the excellent collection of *Noticias para a Historia e Geografia das Nações Ultramarinas*, throwing much light on the early voyages of the enterprizing Portuguese navigators, which are publishing by the Academy of Sciences at Lisbon, and are ably illustrated with notes by the Senhor de Macedo.

Guayana.—Commencing on the northern coast, the river Essequibo and its tributaries have been traced by Mr. Schomburg,

under the direction of the Geographical Society, to within two degrees and a half of the Equator—he has fixed many positions on it astronomically—obtained much information respecting the natives—and made a valuable collection in natural history. In October last Mr. Schomburg ascended the river Courantine as far as 4° 16′ north latitude, where a series of cataracts obliged him to return; the river was there 900 yards wide, and its level 530 feet above that of the sea. Mr. Schomburg, by the last accounts, on Dec. 1, had begun to ascend the river Berbice, with the hope of reaching the line of separation of waters between the Amazons and the Essequibo.

In French Guyane MM. Bauve and Leprieur have explored the river Oyapok, and part of the Marony—some of the details of which will be found in the *Bulletin de la Société de Géographie.*

Amazons.—This mighty river has been explored by two British officers, Messrs. Smith and Lowe, who have shown that an easy navigable passage exists from the town of Pozuzu on the Pachitea, within 300 miles of Lima, by the rivers Ucayali and the Amazons to the Atlantic Ocean; a fact which may prove of incalculable importance to the rising states of Bolivia and Peru.

Peru.—General Miller has accomplished a journey of 150 miles both to the northward and eastward of Cuzco, and has thrown much light on the hydrography of that part of the country in tracing the course of a river supposed to be one of the largest tributaries of the great river Purus, if not the river itself.

Rio de la Plata.—An important addition to our knowledge of this country has just been made by Don Pedro de Angelis, at Buenos Ayres, in a '*Coleccion de Documentos,*' &c., relative to the History of the Rio de la Plata; being a collection of original documents, some of especial value to the topographer, as, for instance, the journal of Don Luis de la Cruz, who in 1806 crossed the Andes and the Pampas, to establish a road from Concepcion in Chile to Buenos Ayres. The work is enriched with valuable notes by the editor; and it is highly gratifying to find the members of a new republic profiting by the first moment of political tranquillity to collect and publish the original papers connected with the history of their country.

Another original document on this part of South America, namely, the 'Diary of Don Basilio Villarino,' who explored the Rio Negro, in 1782, from the Atlantic to the foot of the Andes, has been communicated to the Geographical Society by Sir Woodbine Parish.

M. Alcide d'Orbigny's beautiful work on the Natural History of the Republic of La Plata, and the Banda Oriental, is publishing at Paris, and has reached its twelfth number; and Dr.

Rengger's 'Reise nach Paraguay,' just published at Aarau, gives us the results of eight years' residence in that country.

Patagonia.—Proceeding southwards along the shores of this vast continent, we now come to the account of an expedition just completed, which has brought home a greater mass of accurate geographical information than any expedition since the voyages of Cook and of Flinders; namely, the survey of the coasts of Patagonia, Terra del Fuego, Chile, and Peru, by Captain Fitz Roy, R.N., in His Majesty's ship Beagle. Beginning with the southern bank of the wide Rio de la Plata, every mile of the coast thence to Cape Horn was closely surveyed and laid down on a large scale; each harbour and anchorage was planned; thirty miles of the Rio Negro, and two hundred of the Santa Cruz, up to the foot of the Andes, were examined and laid down, and a chart was made of the Falkland Islands. To the westward of Cape Horn, from the parallel of 47° south to the river of Guayaquil, only 3° south of the Equator, the whole coasts of Chile and Peru have been surveyed; nor has any port or roadstead been omitted. Of the Chonos Archipelago no chart existed. Of Chiloe the best Spanish charts were twenty-five miles in error in latitude. Among numerous other heights measured, the Volcano of Aconcagua was proved to be 23,300 feet above the sea; thus taking rank as third in height in the Cordilleras of the Andes. A detailed description of the great earthquake at Concepcion in 1835; a valuable collection in all departments of natural history, by Mr. Darwin; together with sixty charts, on the scale of 12 inches to a degree, and one hundred plans, and innumerable views, besides meteorologic journals and tide registers, which are now lodged in the Hydrographic Office, attest the indefatigable zeal with which this service was conducted.* Quitting the coasts of South America, the Galápagos Islands, the dangerous Archipelago, and the Keeling Islands were examined, and a chronometric chain of measurement by twenty-two time-keepers, for the first time, has been carried, from east to west, round the globe.

A summary of this voyage, giving all the most important positions obtained, and the chief practical results, has been published in the Journal of the Geographical Society, while the more detailed narrative of its various incidents is preparing to meet the eagerness which the public always feel in a series of operations so wisely planned and so ably conducted.

It were hardly necessary to add, that the Royal Premium "for the

* It is right to mention that this service was most materially assisted by the influential exertions of Mr. Wilson, British Consul-General at Lima, and by the liberal and active co-operation of Don Eduardo Carrasco, hydrographer in Peru.

encouragement of geographical science and discovery," has been awarded to Captain Fitz-Roy, R.N., as commander of this expedition.

AUSTRALIA.

New South Wales.—The exploring party under Major Mitchell, Surveyor-General of this Colony, returned to Sydney at the commencement of the past year, having traced the river Darling (discovered by Sturt in 1828) to lat. 32° 30′ S., long. 142° 30′ east of Greenwich. In March, 1836, Major Mitchell again started on discovery, and within these few days we have learnt that he has succeeded in tracing the Darling into the Murray; has crossed to the southward, and struck the coast near Portland Bay, in 141½° east longitude, about 150 miles to the westward of Port Phillip, where the party had received supplies from the whalers, and were to return by land to Sydney, a distance, in a direct line, of 600 miles. The details of this expedition have not yet reached England.

Another journey, by Mr. Hamilton Hume, already well known as having been the first to strike out a route from Sydney to Port Phillip in 1824, has been effected from Sydney to the south-eastern extreme of Australia at Cape Howe, and thence to Wilson's Promontory at its southern point. The details are not yet known.

South Australia.—The colony recently established in Spencer's Gulf has sent home a cheering account of its prospects, and of the quality of the land.

Western Australia.—From the colony at Swan River, the Surveyor-General has lately penetrated upwards of 150 miles east, and then eighty miles to the northward, but the results are not known. A road has been traced to the settlement at King George's Sound, and is said to pass through a fine country.

North-Western Australia.—Nothing has hitherto been done on this perhaps the most promising spot for discovery in the continent of Australia; but the expedition shortly about to leave England for Swan River will doubtless be enabled to throw more or less light on some of the great geographical problems which attract attention to this remarkable country.

The nautical part under the command of Captain Wickham, R.N., will probably proceed at once to Dampier's Archipelago, and prosecute examination in that quarter before proceeding to the survey of Torres Straits. In the mean time, two young officers of His Majesty's army, Lieutenant Grey, 83rd regiment, and Lieutenant Lushington, 9th regiment, volunteers in the cause of discovery, will be landed with their party at Swan River, and there make arrangements, guided by the best local information,

for prosecuting researches in the quarter which it is considered most probable may lead to important geographical discoveries.

Pacific Ocean.—This, as has been well remarked, is the domain of Vice-Admiral Krusenstern; and he is entitled to the thanks of all navigators for the care with which he registers every new islet discovered in this vast Archipelago. We learn on the authority of our most recent circumnavigators that Krusenstern's charts are the only guides in these seas, and we cordially join with the Admiral in his Introduction to his last Supplement, in which he points out the heavy responsibility which map-makers incur in republishing charts full of inaccuracies, when the means for improving them to a great extent are quite within their reach.

The omission of any notice of what has been done towards the geographical distribution of man, animals, and plants;—of all works on ethnography, or the classification of mankind according to languages, religions, &c., on meteorology, and other important branches of strict geographical inquiry, will strike the most cursory reader of this sketch, but time would not allow of touching on the subject.

Having briefly mentioned what has been done, we cannot deny ourselves the pleasure of noticing the expeditions from other countries now in progress:—

Captain Laplace, well known for his *Voyage autour du Monde* in *La Favorite*, in 1830-32, has again sailed on board L'Arthémise, on another voyage round the world.

At the same time, Captain Du Petit Thouars has sailed in *La Venus*, but in a contrary direction, also on a voyage round the globe.

Captain Dumont d'Urville, companion of Duperré, and commander of the *Astrolabe* in her circumnavigation of the globe in 1826-29, is shortly to sail from Toulon, to endeavour to follow the track of Weddell into the Antarctic Ocean—thence to visit the Polynesian Islands, where he will doubtless obtain much additional information to that he has already given us respecting the natives and languages of this interesting portion of the globe.

From the United States of America an expedition, consisting of five vessels, some fitted for exploring the Frozen Ocean, and provided with the best instruments that the various capitals of Europe could supply, is shortly to sail on a voyage, from which we may confidently expect some important results.

We cannot conclude this imperfect and hasty sketch of the Progress of Geography without recording our testimony to the value of the labours of sister associations,—of the Geographical Society of Berlin, directed by the able and zealous geographer

Professor Ritter, which has just held its fourth anniversary,—of M. Vander-Maelen, whose establishment at Brussels is in itself a society,—and especially of the Geographical Society of Paris, now in the fifteenth year of its existence. Besides its monthly bulletins, it has completed five volumes of a Recueil de Mémoires, some of them of great interest; and particularly that on the Orographie de l'Europe. The two last contain the Relation of Rubruquis, and the Geography of Edrisi, translated by M. A. Jaubert. The work of Abú-l-feda is soon to follow.

Neither can we omit to mention the liberality with which during each of the three past years this Society has awarded a medal for discovery to three of our countrymen—Burnes, Ross, and Back. May the mutual correspondence of the several Societies, and the exchange of information, stimulate each other to press forward in the cause of geography! and we hail the foundation of a Geographical Society at Frankfort-on-the-Main (the news of which has only this day reached us), headed by the names of Kriegk and of Meidinger, as an earnest that many valuable labourers are about to take a share in promoting the object for which we are instituted—the advancement of geographical science and discovery.

XV.—*A brief Account of an Ascent of the Old Calabar River in* 1836. By R. K. Oldfield, Esq. Read June 12, 1837.

[The following pages were accompanied by an eye sketch of part of the river, but the data are not sufficiently accurate to enable us to lay them down on any of our maps or charts.]

Accounts from Fernando Po state that Messrs. Becroft and Oldfield, of that island, have been with the steamer Quorra about 120 miles up the Cross or Calabar river, and beyond the place where the unfortunate Mr. Coulthurst turned back in 1832.* It appears that a people called Itús, residing at a town named Old Ecricok in the Enyon country, have for many years been at war with the natives of Calabar, who are obliged to pass this town on their way to trade with the Qua and Boson countries. The Itú people are well known for their thievish propensities, and wish to levy a tax on all canoes passing their town; and the reason they assign is, that the Calabarians disturb the fish of the river before their town, and that they ought to be made to pay for it. The merchant vessels at Calabar for palm oil have this

* See Journal R. G. S., vol. ii. p. 309.

season suffered considerable detention in consequence of this *palaver*, and therefore Duke Ephraim and King Eyamba solicited Messrs. Becroft and Oldfield to take them up the river in the Quorra steam-boat as far as the town of Old Ecricok, and try to bring the natives of that place to some better understanding.

Friday, September 30th, 1836 (says Mr. Oldfield's journal), the steamer proceeded up the river, having on board Duke Ephraim, King Eyamba, Prince Orf Young, and most of the chiefs of Calabar, accompanied by numerous well-manned and armed canoes with colours flying and music playing. In the centre of each canoe was a bamboo house, and in the bow was mounted a large gun (either a four or six-pounder) on a carriage. Most of the canoes were decorated with four or five flags; indeed flags of all nations were displayed to the breeze.

At 1h. 30m. P.M. rounded the point of what is called Cross River, about 60 miles from the sea, and entered a fine reach in a N.W. direction, with from two to seven fathoms water. Many islands were visible, and between them large sheets of water. The steamer grounded twice, but soon got off when the tide made. We then entered a reach nearly two miles long, with a strong current, islands and mangrove trees in every direction. After being a few hours under way, we passed a small village on the east side of the river, consisting of a few huts in a dilapidated condition: having passed the estuary, we had expected to see a narrow river more like a creek; but to our surprise we entered a splendid reach, 800 yards wide, with three fathoms water, and running in a N. by E. direction; this we named Maconochie Reach. Shortly after we passed a pretty island, thickly wooded, to the west, and called it Becroft's Island. The river widened as we proceeded, and the country began to assume a more enlivening appearance, having abundance of cabbage and bamboo trees on the banks. A few huts only were to be seen on the east bank, and part of a village washed away, the land being overflown to a considerable extent. The next reach we entered ran N.W. by N., with huts on the eastern side, and a beautiful island thickly wooded, its banks also covered with water, which strongly resembled Sunday Island in the Quorra. King Eyamba informed us that near to this place there was a town named Berruk-bah, where the women always brought forth twins. In this reach, which was named Oldfield Reach, is situated the town of Ecricok, almost concealed from view by trees and underwood, in a bay on the west bank, which is here 100 feet high; the width of the river in this part is upwards of a mile. In the evening we went on shore. The ascent to the town is difficult and almost perpendicular; the soil is clay with red sand. There were fifty or sixty head of fine cattle grazing in the market-place. The king is named Tom

Ecricok: he is an elderly man of a dark-yellow colour, and has been frequently trading with masters of ships at Calabar. We called upon him, and had to pass through seven court-yards: the houses are built in the Ibú style, with platforms: the room in which we were was low, the walls built of mud, and for a seat we had a platform of mud, about four feet high, with a pedestal made of soft clay smoothed and painted black. In most of the yards the blood of animals was sprinkled on the ground as fetish for war. The old gentleman invited us to dine the following day at twelve o'clock, when the town gun would fire. Our feast consisted of goats' flesh, fish, palm oil, and pepper, a common dish in Africa. Crowds of women and children came out to see us, but ran away as we approached them, quite afraid. We saw a female, an Albino, with white curly hair, red eyes, and white skin. When I requested to see her, she ran away, and was brought to us, struggling, and much afraid. At the back of this town is a very fine and populous country, named Egbo Syra, the natives of which supply those who reside on the banks of the river with bullocks, sheep, and goats, and large quantities of palm oil.

Oct. 3.—At twelve o'clock we weighed and at one anchored for a few minutes off a village named Headem. This last reach, which is a very fine one, is nearly seven miles long. At 12h. 45m. we had entered another fine reach running N. and S., which was named Laird's Reach, with high banks on the west side of the river, which still continues to wind. It is now 1200 yards wide, the country very fine, and the scenery picturesque. We passed the site of two towns which King Eyamba had set fire to last year. The river begins to narrow considerably a few hundred yards above two islands which we called Mary and Mitchell, and again suddenly widens into an admirably fine reach which we named Blunt's Reach, running W.S.W. In the evening about five we anchored off the town of Old Ecricok, at about 100 yards from the shore. The country here appears to become hilly.

The town of Old Ecricok is situated on the slope of a hill on the south-west bank of the river, and about 250 feet above its level: round the houses is a cleared space; beyond this, on each side, and above the town on the hill, is a complete forest of high trees. We remained here five days, and returned to Calabar on the 8th February. The latitude of Old Ecricok is 6° 40′ N., long. 8° 10′ East of Greenwich.

With respect to this river, we were much surprised to find it so large, and deep; the estuary of the Calabar is larger than that of the Quorra, but it is not quite so wide and deep at the same distance from the sea. The current runs at the rate of 2½ and 3 knots per hour.

From the information of several respectable traders, we learn

that the river continues its course from the N.W., and that it has deep water a great many days' journey up. At the spot whence we returned down the river, the reach, which we named Beaufort's Reach, comes from the N.E., and appeared to widen considerably as far as we could see. The following facts may be noticed: several men from the Boson country came on board, and I was struck with the fetish worn round the head and arms being made of leather, and precisely the same as worn by the natives on the banks of the Quorra. One person had a fetish encircling his head exactly in the same manner as Abboka, the good king of Adamúgo (on the banks of the Quorra) usually wore: the houses at Ecricok and Calabar are built in the same style; the inside walls are also painted in the same manner, with red, blue, and yellow circles. The question naturally suggests itself—Is the Cross or Calabar river a branch of the Quorra or Shary? From what has now been stated, and other circumstances, which I regret want of time will not allow me to enter into, as the vessel is on the point of sailing, both myself and colleague, Mr. Becroft, are of opinion that it is a branch of the Quorra, running out of this river between the confluence of the Shary and Ibú. We are also of opinion that a considerable trade is carried on between the natives higher up and the Ibú country; and it must be observed that the majority of the slaves sold by the Calabar chiefs are natives of Ibú and Nufi on the banks of the Quorra.

XVI.—*Is the Old Calabar a branch of the River Quorra?*—By Captain William Allen, Royal Navy. Read June 26, 1837.

The account of the recent ascent of the river Calabar by Messrs. Oldfield and Becroft, in the Quorra steamer, which was read at the last meeting of the Geographical Society, has revived a question of some importance in the hydrography of that portion of Africa connected with the Bights of Benin and Biafra, in which it will readily be believed I take a more than common share of interest—and which will, perhaps, be accepted as an excuse for the freedom of any remarks I may be obliged to make upon the account of this voyage. Mr. Oldfield is too well known as an African traveller, being one of the three officers only who have survived the expedition up the river Quorra in 1833-4, not to entitle his opinions to some consideration; but as I happen to differ from him on this subject, I feel bound to state my reasons frankly. My only object is to elicit truth; and the discussion

may lead to the clearing up of the point at issue, which will be one more step gained towards our acquaintance with that hitherto imperfectly known continent.

A company of British merchants at Liverpool having, in 1832, fitted out an expedition for the purpose of trading, and exploring the river Quorra, they very liberally acceded to the request of Government that a naval officer might accompany it. I was ordered on this service, and was enabled to lay down a chart of the river Quorra, for a distance of nearly 500 miles from the sea. Shortly after my return, I was desired to furnish a report to Lord Auckland, then First Lord of the Admiralty, on this very question—the connexion of the Old Calabar and the Quorra. I may, therefore, here briefly give the substance of the report I made on that occasion, and then examine the account of the recent voyage of the steamer Quorra.

Although many of my arguments may appear speculative, being drawn from analogy, in support of actual observation on that branch which brought me to the sea, yet I can confidently assert my belief, that during the whole course of the Quorra, there is no divergent to the left or eastward which can at all compete with the new branch; and while I must admit the difficulty of detecting the openings of any branches of the river above Ibú, on account of its great breadth and the frequent intervention of islands, I presume that this preservation of its breadth as far as Ibú, may be taken as satisfactory evidence of the continuity of the main stream; also that the presence of islands is a guarantee that whatever openings may be hidden by them, are of affluents and not of divergents. There are, indeed, 8 and 13 miles, respectively, above the Bonny branch, (which is narrow, tortuous, and shallow, Lander having found it dry in June) two small branches, which may possibly return to the parent stream, but this I had no opportunity of ascertaining. The lower of these I found, in November, to be very shallow, and although the upper one has good depth of water across the entrance, there is within a large sand-bank, and it is much too narrow to be considered as the principal outlet of the mighty Quorra. Admitting, however, that they may be much more important than I thought them, there are still two reasons why they cannot reach the sea at the estuary of the Old Calabar: the first is, that in order to arrive at the given point, they must depart from the previous course of the grand stream, without any obstructing cause, at an angle of 90° nearly, which at the commencement of the Delta would certainly be an anomaly in the course of rivers. The second objection is, that in order to arrive at their destination, they must be made to traverse, or at all events to run parallel with, a range of low hills which I saw about ten miles above them, stretching from the east-

ern bank of the Quorra towards the S.E.; and I think it would also be a novelty to see a river pursuing its course at the foot of a range of elevated land, while it throws off divergents to form a Delta between the high land and the sea.

To the northward of these hills there is almost a continual succession of high land to the Kong Mountains; so that above this point the river cannot branch off, since I believe it is never known that a river separates its waters before arriving at the verge of the alluvial formation.

Having said thus much to invalidate the claim to importance of any other branch of the river, I will mention two circumstances which I think are almost conclusive as to the pre-eminence of the Nún—my peculiar branch. The first is, that it preserves the same general direction as the course of the undivided stream; the second, that it carries its alluvium further into the sea than any other branch; which may easily be seen by the mere inspection of the chart, where the Rio Nún forms the vertex of the Delta called Cape Formoso. I may also adduce the general depth of water in this branch, combined with the dangerous bar at its mouth. These facts are common to all large rivers which form a Delta, where it will be found that the greater the volume of water discharged, the greater is the deposit at its embouchure.

Let us now see what new light has been thrown on the subject by the recent voyage of the Quorra steamer up the Old Calabar river. And here we may remark that it is not surprising that Mr. Oldfield should have fallen into the mistake of supposing the Calabar to be a branch of the Quorra, as he could only compare his track with Lander's chart; which, if my observations in 1834 are correct, places the Quorra at its confluence with the Tchadda nearly one degree and a half too far to the eastward.

As the eye-sketch of the river does not commence until they had advanced sixty miles from the sea, there was no starting point from which to lay it down on my chart of the course of the Quorra, except by working backwards from the latitude and longitude of Old Ecricok, which Mr. Oldfield has fortunately given.* The information, however, which he has furnished, so far from establishing his opinion that the Old Calabar is a branch † of the Quorra, may be, I think, adduced in support of my own, namely, that they are two distinct rivers. Passing over some minor points, the first thing tangible in the statement is, that at the distance of sixty miles from the sea, the steamer 'rounded the point of the

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* Yet unfortunately we are not told on what data it depends, whether by dead reckoning, or by observations, nor where these observations were made.—Ed.

† It cannot be the *principal* branch, by his own showing, as, 'although the estuary of this river is larger than that of the Quorra, it is not so wide nor so deep at the same distance from the sea.' Thus admitting the superiority of the Nún.

Cross river and entered a fine reach;' thus establishing the fact, or at all events Mr. Oldfield's opinion at the time, that at this point there were two rivers, the Cross and another. Now as there is said to be a communication between the Quorra and the Old Calabar, we may presume that at this point the steamer left the creek or branch which *crosses* the common Delta, and entered a distinct river,—the Old Calabar, properly so called at this part, while below it is called, indifferently, the Cross or Old Calabar. This idea receives further confirmation when a little while afterwards we find it said, 'having passed the estuary.' In the eye-sketch of the river, however, Old Calabar river is applied not to that which was explored, but to a stream which appears to fall in at that point; this Mr. Oldfield may perhaps consider as the same river, or it may have been done inadvertently. The general course up the river which he ascended is described as N.W.; this direction, i. e. S.E. from Old Ecricok, would bring the river down towards the Qua mountain of Captain Owen's chart of this coast, and much too far to the eastward for the estuary as there laid down, unless by being deflected by the mountain. This great sweep, however, which the river would have to make, is not mentioned in the account, nor even the existence of the Qua or Rumby mountains; so that their position may be incorrect.* They are, perhaps, farther in the interior, as the natives of Old Calabar are said to pass Old Ecricok in the way to the Qua and Boson countries.

'Having passed the estuary,' the country is described as rapidly improving, the banks become firm and elevated; and in Oldfield's Reach on the right or west bank of the river, 'which is 100 feet high, is situated the (first) town of Ecricok. The ascent to the town is steep and almost perpendicular.' At the back there is a fine and populous country. Proceeding up the river two or three more reaches, he arrives at the town of Old Ecricok, 'situate on the slope of a hill 250 feet high.' Although he says 'this is the part where the country becomes high or hilly,' he has before noticed elevated land, which, although at a considerable distance by the river, he doubtless considered a portion of the same hill.

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* The position of the Qua and Rumby mountains cannot be very incorrect, as they were fixed during the survey of this coast under Captain W. F. Owen, R. N., in 1826. The Qua mountain lies 64 miles N. 17° W. of the Peak of Camaroons; and, as it was visible at a distance of 80 miles, cannot be less than 5000 feet above the sea. The highest peak of the Rumby range, situate 44 miles N. 8° E. of the Camaroon Peak, was seen at more than 60 miles distant, and the elevation may be therefore assumed at 3000 feet; while the lofty Camaroon Peak (in lat. 4° 13′ N. 9° 10′ E. long.) rises to upwards of 13,000 feet. Clarence Peak, in Fernando Po, only 46 miles distant, bearing S. 21° W., rises to 10,700 feet above the sea. A section here, in a N.N.E. line, would show, perhaps, one of the most remarkable valleys in the world, as there is a depth of 40 fathoms between Fernando Po and the mainland.—See Admiralty Chart, and Owen's Narrative, vol. ii. p. 365.—ED.

Here then we have arrived at a spot which must determine whether the Old Calabar be a river *per se*, or a branch of the Quorra, since at this point we find it, before reaching the alluvial formation, ready to deposit the débris of the higher countries on the margin of the sea, forming like all great rivers a Delta at its mouth; and, consequently, discharging its waters by numerous channels, into which the main stream becomes divided. It is true Mr. Oldfield does not mention any such divergents, yet the continuity of overflowed land warrants my saying that the alluvium commences at Ecricok, thirty miles more in the interior than that of the Quorra—a very remarkable circumstance. Now as I believe, in no river, does a division of the waters take place before the commencement of the alluvium, at this part the two rivers by the hypothesis should coincide, and Mr. Oldfield would have found himself just below the last range of hills, between Okòh and Brockedon Islands; which, as he has passed that part four times, he could not have failed to recognize. He has, however, set the matter completely at rest by giving the latitude and longitude of Old Ecricok, 6° 40′ N., and 8° 10′ E.; which establishes this part of Old Calabar at a distance of nearly eighty miles from the nearest point of the Quorra, and having an elevated tract of country between. By Lander's chart it would be about half that distance, and he might have concluded (the intervention of high land being overlooked) that the two rivers have their separation somewhere above Kiri.

The accounts of the natives, that the course up the river is N.W. for several days, is too vague to be entitled to any consideration. Mr. O., indeed, says (but this is at variance with his chart, and one must be a mistake,) that above Old Ecricok, Beaufort's Reach stretches away to N.E. as far as the eye can see. The astronomical position, however, that is given makes the mean course to be N.N.E. by compass.

The coincidences which are mentioned of the huts, fetishes, trade with the Ibú people in slaves from Nufi, &c., are entitled to little weight, since they only prove that a considerable intercourse is carried on between the natives of Ibú and those of Old Calabar, which may easily be by the *Cross* and other creeks intersecting the great Delta, on which both these towns are situated. The unfortunate Mr. Coulthurst is said to have penetrated by the Old Calabar to Ibú; but this only proves the great extent of that country; and a further proof is, that our pilot, Al Hajji, could not understand one word of the language spoken by the men at Fernando Po (said to be from Ibú), although he spoke the Ibú language of the Quorra with great fluency.

These considerations confirm me in the belief that although there is doubtless a communication between the two rivers by the *Cross*, which traverses their common Delta, like the creeks con-

necting the various branches of the Quorra, the Old Calabar is an independent river, having its source far away to the N.E., and which, having drained the S.E. side of the elevated range of the Kong Mountains, which I have named after his late Majesty, empties itself in the neighbourhood of the Quorra, forming with it a common Delta. Nor is this proximity of the embouchures singular with respect to large rivers, since we find it to be the case with the Ganges and Burrampooter: and at the very spot in question, besides the Old Calabar and the numerous mouths of the Quorra, the Rio del Rey and Camaroons, large and distinct rivers, both fall into the Bight of Biafra.

XVII.—*On the Island of Old Providence, by* Mr. C. F. COLLETT, *R.N.* Communicated by Captain BEAUFORT, Royal Navy, F.R.S., Corr. Inst. France. Read 22nd May, 1837.

DURING the progress of the survey of the Eastern Coast of Central America, and of the Islands and Cays adjacent, under the direction of Captain Richard Owen, in his Majesty's ship Thunder, in 1835, we visited the Island of Old Providence.

This small island, of which no late authentic description has appeared, claims attention from the notoriety of its having been the resort of both former buccaneers and more modern privateers, as well as from the fertility of its soil, which requires little cultivation to produce a sufficiency for the inhabitants. Situated about 125 miles from the nearest part of the Mosquito Coast, and 38 miles only from the edge of the Mosquito Bank, it can be seen at a distance of from eleven to twelve leagues, and is easily distinguished from the neighbouring island of St. Andrews by the curious outline of its abrupt and peaked mountains. St. Andrews (from which it may be seen in clear weather) bears from it S. by W. ½ W. 47 miles.

The positions of the island and cays, as determined by the recent survey, are as follows:—

	Lat. North.	Long. West of Greenwich.
Low Cay at the N.W. extremity of the Coral reef . . .	13° 31′ 36″	81° 20′ 30″
Basalt Cay 45 feet high . .	13° 24′ 0″	81° 22′ 10″
North end of Catalina .	13° 23′ 40″	81° 22′ 10″
Isabel . . .	13° 22′ 54″	81° 82′ 0″
Highest peak, near the centre .	13° 21′ 0″	81° 21′ 50″
South point . .	13° 19′ 15″	18° 23′ 10″

Var. compass 6° 45′ easterly, May 1835.

Separated from its northern end, by a cut or channel of from forty to sixty yards wide, is the island of Santa Catalina, 1800 yards long, by 1300 in its greatest breadth, forming the northern boundary of a harbour thence named, affording secure anchorage in from two to three and a half fathoms. Both these islands are very hilly, and on approaching them, present a delightful variety of beautiful scenery. On the authority of one of the oldest inhabitants, the channel between the islands is said to have had eight or nine feet water; at present, however, it has, at its eastern entrance, only two feet. This change of depth may be accounted for by the drift of sand and stones from off the reefs, whence there is almost a constant set into the cut, owing to the prevalence of N.E. and E.N.E. winds.

In tracing the history of these islands, which may be found on reference to Ringrose's Translation of the Lives of the Buccaneers, published in 1684, the larger may be identified as St. Catharine, of which much mention is therein made. From whom, or when, it received its present name of Old Providence it is not easy to say.

Old Providence is nearly four miles and a quarter long, and two and a half in its greatest breadth, of an irregular oval shape. The highest ground, which can hardly be called a point, near the centre of the island, rises to 1190 feet above the level of the sea; from this other hills, mostly wooded to their summits, diverge towards the shore, and terminate boldly. The island is surrounded by an extensive bank of coral and coarse sand, stretching to the northward for ten miles and a half: a reef, in many parts dry, extends in a northerly direction, at a distance of three-quarters of a mile along the eastern side, till within about three miles of the north-east angle of the bank, whence it trends west across the bank for two miles and a half, having at its western extremity a small cay, about two or three feet high, composed of coral sand and stones, brought there by fishermen from the islands. On this northern part of the reef, and three-quarters of a mile to the eastward of the cay, His Majesty's schooner Jackdaw was wrecked on the morning of the 11th of March, 1835. This unfortunate occurrence was occasioned by the inaccuracies of the Spanish plan of the island with which she was supplied, and the best then published, which only made the reef to extend four miles and a half from the land instead of ten miles, added to a strong south-west current.

Since this time a very accurate chart of the islands and cays adjacent has been completed on the scale of four inches to a mile, which represents all the features of this extensive bank and coral reef very minutely*.

* The wreck of the Jackdaw was complete, and the lives of the crew were only saved by the presence of mind and decision of Lieutenant Barnett, her commander, who, seeing at once the impossibility of avoiding the reef, ran his vessel directly on

This reef binding the eastern shore of the island extends to, and terminates at, a distance of a mile and a quarter from its southern point, whence the soundings extend in a southern direction from two miles and a quarter to three miles. The sea almost constantly breaks on the reef, so that it can be discovered long before the bank is approached; and although the openings in the reef have a depth of from three to five fathoms water, a passage is seldom attempted, except in small vessels. The coral rocky heads within (*i. e.* to the westward of the reef) are very numerous and dangerous, and some small wooded cays are situated to the northward of the islands.

Old Providence should always, if possible, be approached from the northward and by day, in consequence of the prevalence of the N.E. winds, making it in the parallel of 13° 32′ or 33′; soundings will be first got on the bank in from 15 to 17 fathoms, coarse coral sand; then steer W. by N. ½ N. by compass, keeping along to the northward of the reef at about three-quarters of a mile distance, till the highest peak on the island bears S. 3° E.; then shape a course towards it, rounding the western elbow of the reef, at one and a half or two cables' distance, when, after a run of about three-quarters of a mile, good anchorage may be obtained in five, eight, or ten fathoms, with the Low Cay bearing N.N.E. If, however, intending to proceed to the anchorage off Santa Catalina, on rounding the reef, steer S. by W. ½ W., nearly six miles, until Morgan's Head transits the highest peak in the island; then haul up S.E. by S., and stand on till Basalt Cay bears E., Morgan's Head S.E. ¾ S., and anchor immediately on obtaining soundings in five or six fathoms. For a vessel coming from the southward and by night, the most advisable plan would be, on making the land, to lie-to till day-light, keeping it in sight; when, in the morning, the beat up to the anchorage would not be above six or seven miles, with a certainty of a good breeze and smooth water. In working up the clearness of the water enables the eye to detect the shallow rocky heads, which abound within three cables' length of the whole edge of the bank.

No dependence can be placed on the currents, as they vary in strength and direction *off* the bank, while determining the outer eastern part of which an almost invariable set to N.W. was experienced.

The tides are variable, sometimes, in north-westerly breezes, rising as much as two feet; but no greater rise or fall than six or seven inches was observed during the six weeks (part of April and May) that the boats and the ship were employed surveying the island.

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the most favourable spot for enabling him to construct the rafts, by which, with the assistance of a sloop, his crew and provisions were landed with safety.—Ed.

The only harbour is that of Catalina, before mentioned, to enter which a pilot is almost indispensable. The anchoring ground is good, and although open to the winds from N.W. to S.W., the reefs in that direction form a barrier to the setting in of a heavy sea.

Morgan's Head (named after the noted buccaneer) is a very remarkable rock, nearly detached from the S.W. point of Catalina Island. It rises forty feet from the level of the sea, and from its proximity to the rocks of the island is not easily distinguished till closely approached. On entering the harbour it will be found to bear a striking resemblance to the figure of a man's head, and gradually developes the profile of an elderly-looking ruffian.

Split Hill, near the northern end of the island, is 550 feet in height, and has the extraordinary appearance of a hill having been, by some sudden convulsion of nature, rent in twain as far as one-third down from its summit. It is peaked on either side of the chasm, which is about sixty feet wide and eighty feet deep.

The geological structure of this island would seem to be chiefly limestone, containing numerous small but deep caves near the water's edge, which being filled alternately with air and water, cause a strange spouting, accompanied by a loud roaring. The rocks generally are precipitous. I am not aware that basalt has been found on the island, unless the fine black sand on the western side, which is attracted by the magnet, be the remains of decomposed basalt. But at Basalt Cay, about 400 yards to the northward of Catalina, the basaltic columns rise to forty-five feet above the sea, and stand about fifteen degrees from the perpendicular, inclining to the southward. The coral formations appear to resemble those in other parts of the West Indies.

The watering place for ships is situated on the western shore, at two miles and a quarter from the anchorage in the harbour; it can be easily recognised by being a little to the southward of some white cliffs. It is the largest of four streams, issuing from one spring, situated in the highest part of the island. The filling place, whence excellent water of a chalybeate quality was procured, is about 100 fathoms from the mouth of the stream, and partially hid by a sandy beach, through which it forces itself after heavy rains. No spring of water is to be found on the small island of Catalina.

Wood, for fuel, can be procured on the western part of Catalina, where there is no cultivation, from its being very hilly. The mountain grape and goatwoods are the best. No trees, large enough for spars for ships, grow on either island. The calabash and mangrove furnish good knees for boats; the latter grows in swampy ground and near the beach. Cedar is good, equal to

that of Cape Gracias á Dios, and squares from twenty to twenty-four inches. Iron-wood is found on the N.E. hill of Old Providence. Manchineel, or manzanilla, is found in abundance. A very curious shrub, of from twelve to fifteen feet in height, called by the inhabitants the cockspur, is found in great quantities all over the island. It receives its name from the resemblance of the pods, which cluster the bush, to the shape of a cock's spur. The pods when ripe are occupied by numerous small black ants, whose bite is so severe as to be said to have caused death in two or three instances. This shrub is not found on any other island in these seas, and no account of its having been imported exists.

Good stock is plentiful; in fact the soil is exceedingly productive, and nature here appears in abundant luxuriance, affording to the animal creation the greatest profusion, with very little cultivation. Fruits of various kinds, such as sapodillas, mangoes, oranges, tamarinds, plums, limes, &c., are plentiful. Wild pigeons, guanas, and hiccatee or land-turtle, abound; the latter are found in the mountains, and form a delicious article of food. Yams may be had at six shillings the cwt.; likewise cocos, plantains, and pumpkins. The cattle are generally in good order; bullocks of 4 cwt. or 5 cwt. sell at from 3*l.* to 4*l.* sterling a-head; pork 4½*d.* a pound. Fowls in abundance at 12*s.* a dozen. Turkeys from 4*s.* to 6*s.* a piece. Horses are a fine breed, rather small, and purchased at from 3*l.* to 4*l.* sterling a-head. There are a few asses on the island. Fish, peculiar to these latitudes, abound in profusion on the banks: sharks are very numerous.

Cotton is the staple export, and is cultivated more or less by every one. This, with turtle-shell and a few hides, are the principal articles of trade. About 30,000lbs. of cotton and 170lbs. of shell are annually taken away by the traders in exchange for English calicoes, cloths, &c., brought from Jamaica. The exorbitant prices of these cause the island purchasers to incur a debt which the next year's produce serves to liquidate. This system of keeping the inhabitants a season a-head in debt, is the trader's interest to adopt. Cotton is planted in June, and gathered from December to May. Sugar-cane and coffee are grown, but only in sufficient quantities for their own consumption. The berry of the latter is of a superior quality, but is so long in arriving at perfection, besides requiring great labour in its cultivation, that it is seldom or never exported.

In the beginning of 1835 the population, by the last census, was 342 persons*, about one-half of whom were slaves. The

* This is rather at variance with the account of this island given in the "Dictionnaire Géographique Universel," published at Paris in 1831, in which it is stated that this island "is not inhabited."

younger part of the community employ themselves turtling: they divide six months of the year into two seasons, of which March, April, and May is called the 'running,' and June, July, and August the 'crawling' season. They have three vessels of from ten to fifteen tons burthen, employed thus, which, from their size, are managed very easily among the banks they frequent—such as the Serrana, Serranilla, Roncador, &c. The inhabitants are generally hospitable, but have neither form or observance of religious duties. Marriages are contracted by civil ceremony and bargain; and their only recognition of a supreme power is in the respect they pay to Sunday, which is marked by a total cessation of labour, and attention to external appearance. To speak of the moral character of these people would perhaps be hazardous; they have few temptations to drunkenness, restrictions being placed on the introduction of spirituous liquors. Thefts and other crimes are dealt with severely.

It is to be regretted, that though in a remote corner of the western hemisphere, there should be so many persons without the advantages, or means of Christian instruction; and it is rather a matter of surprise that missionaries,* either of the Protestant or Roman Catholic Church, have not found their way to a place so well calculated, in every respect, to ensure success to their labours.

The island is under the government of the republic of New Granada, but more immediately so under that of St. Andrews, the two islands, Old Providence and St. Andrews, forming the ninth canton of the republic. At the latter there is a governor, a few soldiers, a collector, and a civil magistrate. At Old Providence a collector and a civil magistrate reside, who administer the government with two assistants. English is the language spoken. Their flag is red, blue, yellow, vertical in equal parts, the red being nearest the mast, with a white star of five points in the blue division. Criminals are transported here and to St. Andrews, for which purpose these islands appear to have been used by the Spaniards previously to their being taken possession of by the buccaneers.

Old Providence is visited by the traders who frequent the coast from Cape Gracias á Dios to San Blas. No regular trading was commenced until the arrival of an adventurer named Aurey, in 1817-18, when the South American colonies, separating from the mother country, presented an opening for privateering. This Aurey having obtained a commission from Buenos Ayres as an independent chief, was followed by several others to

* Being under the Government of Columbia it is believed that none but Roman Catholic teachers would be tolerated.

this island, who paid him for commissions, and 18 per cent. on all captures. Being bold and energetic, he established a government and repaired the principal fort, which thenceforward took his name. His vessels, commanded by adventurers like himself, annoyed the Spanish trade very successfully. They stormed and took several places along the coast, among the rest Truxillo, which they plundered, and brought the spoil to this island. In consequence many traders resorted hither, and the island was then more populous than it has since been. The principal trader at present is a Mr. Shepherd, of San Juan de Nicaragua, who has several sloops and schooners.

The only town—so called by the islanders, and named Isabel by General Aurey, after one in the Gulf of Dolce, stands at the northern end of the island, at the head of Catalina harbour, close to the channel between the two islands. Not more than eight or nine houses or huts now remain of what was once a populous and flourishing place. Several houses and plantations are scattered over the island, accessible only by a sort of road which passes round the island. No one resides on Catalina; all the ground there capable of cultivation is laid out in plantations of corn, cotton, &c. One of the oldest inhabitants is M'Kellar, the pilot, who boasts of being a Scotchman, and was in the habit of amusing us with many interesting anecdotes of the exploits of General Aurey and his followers, in which he generally figured as a principal character.

During a short war with Spain in 1625-6, the Spanish Guarda Costas were constantly employed in aggressions upon the trade of the English and French, and by their own severity gave room for the system of buccaneering, at first adopted in self-defence and retaliation, and subsequently persevered in from habit and a love of plunder. If time did not permit the buccaneers to lavish their booty away in their usual debaucheries, they used to hide it in the desert cays which they frequented, and where much valuable treasure is still supposed to be concealed.

In 1664, when the Spaniards were in quiet possession of the island, Mansvelt, celebrated alike for his daring and crimes, took it by storm, considering it well adapted for the head-quarters of the lawless band of which he was the leader. At his death Morgan assumed the command, and viewing the island in the same light as Mansvelt, took possession of it in December, 1670. At this time the small island of Santa Catalina was well fortified, having no less than nine batteries on it, mounting in all forty-nine guns. Remaining some time here, his followers continued their depredations upon the Spaniards, always bringing the spoil here. Before Morgan left it, he threw the guns of the forts into the

sea and set fire to the houses and forts, preserving one of the latter only from complete destruction. Remains of three batteries can still be traced. Morgan was knighted in 1675; in 1677 he was appointed deputy-governor of Jamaica, with a salary of 600*l.* In the ensuing reign of James II. he was recalled to England on account of his not only conniving at, but assisting in, the depredations committed by the English buccaneers on the fleets and subjects of Spain.

Little mention is made of the island till 1795, when a few families from Blewfields, on the Mosquito Coast, settled by permission of the Spaniards. From this till 1817 it remained quite tranquil, when General Aurey took the command as before stated. At his death, in 1821-2, which was occasioned by a fall from his horse, the privateers dispersed, and the island resumed its present quiet state under the republic of Granada.

On reading Miss Jane Porter's interesting narrative of Sir Edward Seaward's shipwreck, little doubt can be entertained but that the islands to which she alludes are the same that have been described, for there exist no two islands so large and closely situated as Old Providence and Santa Catalina along the whole line of the Mosquito Coast. In her preface to that work, p. ix., she states:—'The islands which form so large an object of interest in this work may be found in old charts in the neighbourhood of the Serranillas, but until Sir Edward Seaward, on being cast ashore there, discovered them to be habitable, they had been marked down as a cluster of barren rocks only, whose dangerous reefs warned ships to avoid them.' Had she favoured her readers with a copy of the chart to which she occasionally alludes as having been constructed under the direction of Sir Edward, a more certain conviction as to the identity of the islands on which she has founded her work would have been obtained: as it is, we are only left to conclude from her accuracy in delineating their situation, resources, productions, and proximity to the Serranilla Cays, (which are only a composition of sand and stone, not more than six feet in height,) that the islands of Catalina and Old Providence were the scene of the events she has so admirably narrated.

XVIII.—*Extracts from the Journal of a Voyage round the Globe in the years* 1833-36. By F. D. Bennett, Esq., Mem. R. Coll. Surg., R.G.S., &c. Read June 26, 1837.

The following pages contain the principal geographical and statistical facts noticed during a whaling voyage round the globe by the western route, in the years 1833-36. The highest S. lat. attained was 58½°; the highest N. lat. 50°, on the western side of the continent of America. The chief places visited during the voyage were Juan Fernandez; Pitcairn's Island; Tahiti, Huaheine, Ulitea or Raiatea, Taha, and Maurua, of the Society Islands; Oahú and Maui or Mowee, of the Sandwich Islands; Cape St. Lucas, in California; Sta. Christina, and Roapoa, of the Marquesas group; Christmas Island; Caroline Island; Timor; and St. Helena. Spermaceti whales were noticed eighty-nine distinct times; and seventy-eight whales were secured, from which the quantity of sperm oil and spermaceti obtained was about 245 tons. The voyage was happily completed without the loss of one of the crew, either from disease or accident.

October 17, 1833, the ship Tuscan of 300 tons, T. Stavers, Commander, sailed from the port of London, and on the 26th sighted the island St. Antonio of the Cape de Verd group. In lat. 8° N., long. 23° W. we lost the N.E. trade wind, and experienced calms and light and variable airs, during which we saw the first spermaceti whales.

On the 4th December we crossed the equator in the long. of 23° W. In lat. 38° S., long. 51° W., the barometer fell during twenty-four hours from 30·10 to 29·60, followed by a severe gale from the westward of twenty-four hours' duration, and being within the limits of the "Brazil bank" the water presented the green hue of soundings. The temperature of the sea at this time was considerably higher than that of the surrounding atmosphere, and gave to the hands immersed in it a very agreeable sensation of warmth. Numerous ocean birds of the high south latitudes were visible around us, as petrels, pios, wandering albatross, &c., and many were taken by hook and line baited with fat meat. Some species were obtained new to the ornithological collections of this country. We here, also, first noticed many shoals of a species of porpoise almost peculiar to these regions. Its chief peculiarity is the absence of a dorsal fin. The inferior surface of the animal is of a pure white, whilst the back retains the black hue so prevalent in cetacea. This porpoise has been noticed by the French naturalist Péron, and has hence been named *Delphinus Peronii*. From the absence of a dorsal fin, it is known amongst seamen as the "right whale porpoise."

January 4, 1834, in lat. 47° S., long. 57° 29′ W., we passed a floating iceberg, square, and about fifty feet high. Ships should keep a careful look-out. Many penguins were also observed, their home being either the iceberg, or, more probably, the Falkland isles, from which we were distant little more than a day's sail. The albatrosses, which, with many other varieties of ocean bird, attended our progress in great number, presented on either side of the neck a vertical line of delicate rose-coloured plumage, a peculiarity I had never observed in the many examples of this bird I had in former voyages procured off the Cape of Good Hope.

January 14, we attained our highest S. lat., namely, 58° 33′, in long. 68° 53′ W. Although the height of summer, we found the temperature in this high S. lat. unpleasantly low, with showers of hail and sleet; and the sky to the southward often presented the white and luminous appearance termed "ice-sky," or "ice-blink." The barometer continued remarkably low, often falling to 29·20, without any accession of foul weather.

February 11, sighted the island of Juan Fernandez from the mast-head, bearing N.N.W., distant about sixty miles.

Juan Fernandez, on approaching the island,* presents a series of elevated mountains of rugged and arid aspect; the central mountains more level and continuous, but either extremity of the land terminating by conical and gradually declining hills. "Goat Island," situated to the S.W., and of moderate elevation, is separated by a channel about three miles wide, and has its summit surmounted by many conical eminences or hummocks. Its western extremity is bluff, whilst the eastern descends gradually to the water's edge. Goat Island does not exceed four or five miles in circumference; its greatest length being from east to west, and its elevation from four to five hundred feet. Its shores are precipitous, and chiefly composed of a brown volcanic stone, presenting on the faces of many of the cliffs tortuous columnar projections resembling the trunks and branches of trees half imbedded in its structure. This islet has a burnt and desolate aspect, and affords no vegetation higher than a stunted shrub, whilst the few verdant patches of soil tend rather to heighten by contrast, than to relieve the general sterility of its appearance. On the north side, and towards the western extremity, a run of fresh water empties itself into the sea over the face of the cliffs. With much impediment from a heavy surf, we effected a landing on this island, and procured specimens of its natural productions. Vast numbers of violet-coloured crabs abounded on the rocks of the coast, and fish were so plentiful in the waters around as to

* Its height, determined by Captain King, R.N., in 1830, 3000 feet above the sea, and the island of Masafuera estimated at 2300 feet.—Ed.

enable the boats in less than two hours to obtain an ample supply. The ordinary amphibious birds were numerous on the coast, many blue pigeons nestled in the cliffs, and some flights of small birds, and a species of falcon, were noticed. Juan Fernandez affords at its N.E. side the excellent harbour of Cumberland Bay, and ample supplies for shipping.

Pitcairn Island.—Daylight, on the 7th March, disclosed the dark and elevated form of "Pitcairn's Island," directly ahead, bearing W. ½ S. by compass, and presenting mountain land of limited extent. The northern side, on which the settlement is placed, offers a very picturesque appearance; rising from the sea as a steep amphitheatre luxuriantly wooded to its summit,* and bounded laterally by precipitous cliffs, and naked rocks of rugged and fantastic forms. The simple habitations of the islanders are scattered over this wooded declivity, and half concealed by the abundant verdure. The coast is abrupt, rocky, beaten by a heavy surf, and at most parts inaccessible; some coral *débris* are found on the shores, and small coves, but no distinct reefs obtain. At the period of our visit the population of this island consisted of eighty persons,† the majority of whom were children, and the proportion of females greater than that of males. With the exception of the offspring of three Englishmen resident on the island, and married to native women, the entire race are the issue of the mutineers of the Bounty, whose surnames they bear, and from whom they have not as yet descended beyond the third generation.‡ These islanders are a fine and robust people, but are far from possessing handsome features. They are high-spirited and intelligent, and speak both the Tahitian and English languages fluently. In intellect and habits they form an interesting link between the civilized European, and unsophisticated Polynesian nations. Their food is chiefly vegetable. Yams, which are abundantly produced, and of excellent quality, form the principal support of the people, and next to these the mountain taro roots (*arum costatum*), for the cultivation of which the dry and elevated character of the land is so well adapted. Cocoa-nuts, bananas, and pumpkins afford additional articles of diet, but the breadfruit-tree yields a scanty crop of very indifferent fruit. Swine, goats, domestic fowls, and the fish around the coast, afford the natives an occasional indulgence in animal food. Disease is rare amongst these islanders, and *fefe*, or elephantiasis, so prevalent amongst the Polynesian islands, is here unknown.

* The peak reaches 1046 feet above the level of the sea (Beechey's Voyage, vol. ii. p. 675).—Ed.

† In December, 1825, sixty-six inhabitants were found by Captain Beechey thirty-seven of which were the grandchildren of the original settlers (p. 99).—Ed.

‡ The first settlers consisting of fifteen males and twelve females, landed here in January, 1790.—Ed.

A comparative scarcity of water exists, since there are no natural streams, and the volcanic structure of the island precludes the formation of wells. Hence the inhabitants depend upon rain water received into excavations or tanks. It is not, however, until rain has been absent seven or eight months that any inconvenience is experienced from deficiency of water.

The disastrous emigration of the Pitcairn islanders to Tahiti, and their subsequent return to their native land, is well known.* At the time of our visit, nearly two years had elapsed since their return, and the people had in a great measure resumed their systematic and simple habits, and the lands their cultivated state; but the injurious effect of a more enlarged intercourse with the world was yet evident in the restless and dissatisfied state of many amongst them, and a licentiousness of discourse which I cannot believe belonged to their former condition.

I lament to say we found them in a very unsettled and uncomfortable state, and divided into two factions opposed to each other with a rancour little short of open warfare. The particulars of this discord it would be tedious to recount, but its origin appeared due to the recent arrival on the island of an elderly person named Hill, who had appointed himself their teacher, governor, &c., and had formed a legislative body composed of some few of the more powerful inhabitants, but to which the mass of the population was much opposed. Their great wish was that a British ship of war should arrive and settle their disputes.

Two only of the original settlers from the Bounty existed in the island at our visit, and those were the aged Tahitian females, Isabella Christian, the widow of the notorious Fletcher Christian, and Susan Christian, his son's widow. But we were shown various books and other articles which had belonged to the Bounty.

There can be little doubt on the subject that Pitcairn's Island has had inhabitants previous to its occupation by the people of the Bounty, since numerous remains of aborigines have been found by the present inhabitants whilst cultivating the ground; indeed, the fact may be considered confirmed by the recent discovery of two human skeletons inhumed on the soil, resting side by side, and the head of each reposing on a pearl shell. This last circumstance casts a yet greater mystery over the history of these aborigines, since the pearl shell, although found in the adjacent islands, has never been met with in the waters around Pitcairn's Island. To Hannah Young, the youngest daughter of John Adams, I am indebted for the possession of two stone adzes, supposed to have belonged to this

* See Royal Geographical Society Journal, vol. iii. p. 165.

ancient race, and which were found embedded in the earth. They are rudely fashioned in the ordinary Polynesian form of such utensils, are composed of a black basalt highly polished, and bear an appearance of great antiquity. It is difficult to account for the apparent extinction of an original race upon a spot so replete with every essential for the support of human existence, and we are led to the hypothesis that either one of the epidemic diseases that occasionally scourge the islands of the Pacific had destroyed the inhabitants to the 'last man,' or that the original occupants were merely a few male natives of other lands, cast upon this when distressed, during one of the adventurous voyages so usually undertaken in their open canoes.* The position of the village on Pitcairn's Island was fixed by Captain Beechey, R.N., who surveyed the island in 1826, in lat. 25° 3′ 37″ S., long. 130° 8′ 23″ W. of Greenwich.

After obtaining ample supplies of live stock and vegetables, in return for some useful manufactures of Europe, we left the island accompanied by three Englishmen who had resided on Pitcairn's Island many years since, but who had suffered so much persecution during the late discords which had unhappily prevailed, that they were glad to avail themselves of a passage to Tahiti, until they could return to their wives and families at Pitcairn's Island under competent protection.

Society Islands.—This group of islands, six of which were discovered in his first voyage by our excellent circumnavigator, Cook, is comprised between 16° and 18° S. lat. and 148° and 152° W. long.

During our various cruises in these seas, we at different times visited the chief islands, which have been often described; yet I may be permitted to add a few extracts from my journal with respect to this highly interesting group.

Maitea.—March 21st, sighted the small but elevated † and uninhabited island of Maitea; ‡ and on the following morning made the island of Tahiti, about sixty miles farther to the west.

Tahiti presents an elongated and high range of land, apparently divided into two distinct islands, the low and narrow isthmus that connects the two peninsulas, not being visible until closely approached. Its general aspect is exceedingly mountainous, some level and highly fertile plains or valleys intervening, whilst a broad belt of alluvial soil occupies the coast.

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* This could hardly be consistently with the images and large piles of stones on the summit of the hills found here.—Ed.

† Its peak 1432 feet above the sea (Beechey's Voyage, vol. ii. p. 675).—Ed.

‡ Osnaburg Island of Wallis in 1767; Pic de la Boudeuse of Bougainville in 1768; San Cristobal of Boerecha; and Dezena of Quiros, as being the tenth island discovered in the voyage of Mendaña and Quiros in 1595.—Dalrymple's Voyages, vol. i., p. 42. *Matilda* or Osnaburg Island of the Charts is in 21° 50′ S. 138° 45′. W.— Ed.

The loftiest mountain on this island is situated towards its northern extremity, and may be estimated at between 6000 and 7000 feet elevation.* It has never been ascended by an European, nor has any exact measurement of its height been given, but the summit has been gained by some natives, who report the existence of a lake of yellow water (probably an extinct crater), and the presence of wild ducks differing in plumage from the more common kind indigenous to the island. The aspect of the lowlands of Tahiti has latterly undergone a considerable change, from the extent to which the guava shrub flourishes on the soil. Scarce twenty years have elapsed since this fruit tree was introduced from Norfolk Island, and it now claims all the moist and fertile land of Tahiti, in spite of every attempt to check its increase. The woodlands and bush, for miles in extent, are composed solely of this shrub, which bears a profusion of large and delicious fruit. The people have advanced but little in civilized habits; their dwellings are much as described by the earliest European visitors, and European clothing is adopted to but a scanty extent. Their principal improvements are in religious observances, and in the acquirement, to a great degree, of the elements of education.† The commerce of the island is confined to the exportation of pearl-shell and pearls, sugar and cocoa-nut oil, and arrow-root, which is altogether conducted by foreigners, since the natives do not themselves possess any vessel larger than a double canoe. The port dues, however, and trade for supplies afforded by the numerous English and American whale ships calling at the port, yield the natives much emolument, and trade in kind has now given place to the circulation of specie. In commercial importance and civilized improvements Tahiti, notwithstanding its priority of intercourse with civilized nations, is at least half a century behind Oahu, of the Sandwich group. A consul from the United States of America has lately been appointed to this island, so much the resort of American shipping. The British consul, whose charge includes all the principal groups of the Pacifics, resides at Oahu, of the Sandwich group, a distance of five weeks' sail from Tahiti, and the communication uncertain.‡ Saddle-horses imported from South America are now in general use at Tahiti, both by natives and foreign residents; oxen are also numerous, and shipping in the port are supplied with beef, in quality little inferior to that of England, at about 2*d.* per lb.

* Roughly estimated by Beechey at 7000 feet. Blossom's Voyage, p. 195.—Ed.

† The population is estimated at from 18,000 to 20,000, chiefly Christians, under the care of eight missionaries of the India Missionary Society.—See Williams's "Missionary Enterprises."—Ed.

‡ In February, 1837, Mr. Pritchard was appointed Her Majesty's Consul for the Society and Friendly Islands, to reside at Tahiti.—Ed.

An opinion very generally prevails at Tahiti that the interior and mountainous parts of the island are inhabited by a race of people differing from those of the coast, and of timid and secluded habits, but it seems scarcely probable.

During our stay here I made an excursion, in company with Captain Henry, to the celebrated lake of Vaihiria, the road to which commences from the coast at the district of Mairipehe, on the S.E. side of Tahiti, and distant from the settlement of Papeiti about thirty miles. The route lies along the coast, and affords numerous highly picturesque scenes. On the S.W. side of the island I noticed the numerous caverns which penetrate the base of the precipitous cliffs that form this portion of the coast. One of these caverns, which we inspected, was situated at the base of a mural cliff of about two hundred feet in height, and its face clothed with ferns and other elegant verdure. The mouth of the cavern formed a large arch; the bottom of the cavern was occupied by a sheet of fresh water produced by infiltration through the rock. I also noticed here a number of springs of fresh water that rise from the midst of the sea at greater or less distances from the shore. Their situation is marked by small eddies or whirls on the smooth surface of the sea over the coral reef, and upon some of these the natives have placed bamboos with apertures in their sides, through which the fresh water flows as from a pump; when fishing on the coast in their canoes, it is not unusual for the natives to dive beneath the surface of the sea and quench their thirst at these fresh-water springs. The cause of their existence is of course simple, although the effect is somewhat extraordinary. Without departing greatly from our route along the coast, we visited the "Great Morai of Papara,"* which, although much ruined and reduced in its height, yet retains a great share of its original gigantic and not unornamental structure. This Morai is not, correctly speaking, in the district of Papara, but in the district of Tevauta, on a spot named "Mahiatea." Towards sunset we arrived at Atinua, where we passed the night, and early on the following morning proceeded about three miles to the coast of the district of Mairipehe, whence I commenced an inland route towards the lake of Vaihiria on foot, and accompanied by a native guide. The greatest portion of the journey lay through level and well watered plains, abounding in an over luxuriant vegetation, and winding round the bases of steep and elevated mountains. A river rising inland traverses these plains with a circuitous and impetuous course to empty itself into the sea. The road to the lake follows closely the course of the mountain stream, and only departs from it to evade

* Mentioned by Cook, Wilson, Ellis, Beechey.—Ed.

a circuitous bend, or to escape cascades and deep fords. We had to cross this river (which, at the fords, ran with great force, and was often both deep and broad), about one hundred and eighteen times during the day's tour to the lake and back. When half way between the coast and the lake of Vaihiria, we lost the cocoa-nut and other fruit trees, and the more usual vegetation of the coast, and entered upon lands covered with bushy ferns, elegant parasitic plants, and extensive thickets of a species of amomum, rising as distinct reed-like leaves six or eight feet above the soil, and emitting, when broken by pushing through them, a powerful fragrance, not unlike that of pimento. Numerous groves of the mountain plantain, loaded with their large clusters of ripe fruit, were also visible on the heights around. The lofty steeps, at the base of which we journeyed, presented constantly the deceptive appearance of closing upon the level path we pursued. We continued, however, along the torrent until nearly at the lake, when we ascended a steep and rugged hill, from the summit of which was visible the lake of Vaihiria, laid out in all its placid and picturesque beauty in the vale at our feet, and to which a short but steep descent conducted. The lake presents a sheet of water of nearly circular form, situated in the midst of a deep and circular valley surrounded by elevated precipitous mountains covered with a short and bright verdure, whilst numerous small cascades fall over their faces into the basin beneath. The lake does not exceed a mile in circumference; its waters are perfectly fresh, and of a dull green colour; for some distance from the shore the depth is very trifling, and it is said that in no part of the lake it has been found to exceed eighty feet. The shores of the lake are formed by the bases of the mountains in some parts, in others by a sandy beach, strewn with large boulders of black volcanic stone, or by low ledges of breccia and volcanic stone of a very friable character. Many wild ducks were visible on the water, and the plaintive note of a bird, not unlike the cooing of a dove, alone interrupted the tranquillity of the spot. Eels are the only fish known to inhabit the waters of the lake, which is rather an inland than a mountain lake, since, although surrounded by mountains, its elevation above the sea can be but inconsiderable, as no remarkable ascent is evident in the route that conducts to it from the coast, except the steep ascent in its immediate vicinity, which is merely that of its bounding hills, and is almost compensated by a corresponding descent to the lake on the opposite side.*

Returning by the same route I reached Mairipehe by six o'clock in the evening. The coast here is well protected by an

* Estimated at 1500 feet above the sea in the Blossom's voyage.—Vol. i., p. 420.—Ed.

extension of the barrier coral reef, and the tranquil water within the reef affords good anchorage for shipping, off a native village where every essential supply can be obtained. A second natural curiosity that I visited at Tahiti was the "Ofai marama" (moon stone) of the natives, which affords a fair example of a basaltic column, and is situated in a cavern at the foot of a lofty cliff at the termination of the valley of Punaro, on the western side of the island. The half-embedded column, which protrudes horizontally, is seven feet in length, three and a half in height, and six feet in breadth; dark and polished on its surface, which is marked with regular vertical fissures. Its extremity, that presents itself at the aperture of the cave, has a smooth surface, resembling the half-risen moon in shape, whence the native name.

Although, from its geographical situation, Tahiti may be deemed under the full influence of the S.E. trade winds, both N.W. and S.W. winds are not unusual, especially during the months of February and March, at which time the natives calculate upon those winds to make voyages to the islands S.E. of their own. There is reason to believe that the N.W. monsoon of the eastern hemisphere, south of the equator, extends at times to the more eastern of the Polynesian islands. Captain T. Stavers, of the Tuscan, possesses on his charts a remarkable track made by that ship from the Equator in 174° W. long. to the Society Islands, in an uninterrupted south easterly course of 2500 miles, the winds holding chiefly from N.E. and N.W.*

Raiatea, the Ulitea of Cook, is situated about 130 miles to the N.W. of Tahiti, this being the direction in which the islands of the Polynesian groups usually lie, a direction that volcanic action appears very generally to follow. It is about forty miles in circumference, of mountainous character, covered with vegetation, and but too well watered, cascades, rivers, and swamps abounding in all directions. At the distance of one and a half or two miles from the shore the land is encircled by a coral reef, that also includes the adjacent island of Taha. Here are seven excellent anchorages on the weather and lee sides of the island, accessible at all times, and egress easy, except with a due south wind. Raiatea has no commerce worthy of notice; cocoa-nut oil and arrow-root are occasionally procured by small vessels from New South Wales or South America; attempts have been made to produce tobacco, and to make ships' cordage from the bark of the Hibiscus, for the Sydney market, and bêche de mer, with which the reefs abound, for that of China; but although the island is capable of all these, and many additional exports, opposing circumstances have caused

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* See also Beechey's Voyage and Williams's "Missionary Enterprises in the South Seas," p. 507.—Ed.

every effort to establish a permanent commerce to be speedily relinquished.

The soil is exceedingly fertile, exotic fruit trees thrive vigorously, and particularly the fruit of the lime proves invaluable to foreign shipping, and affords a striking example of the important advantages that accrue from the dissemination of useful fruits and vegetables. The population appeared to me to have suffered dreadfully from disease. Accompanied by some natives, I ascended a lofty range of mountain occupying the centre of the island, extending in a direction nearly N. and S., and about 2000 feet in elevation. The summit presented a level and spacious plain of dark and bleak aspect, spread with numerous swamps and streams of water, passing over exposed rocks of a red colour, and entirely destitute of other vegetation than short grass and moss, although but a few feet beneath, on the less exposed spots, vegetation was lofty and abundant. On the eastern declivity of the mountain, a short distance below its summit, I was shown by my guides a natural excavation about forty feet deep, resembling a large well about thirty-six feet in circumference, the character of which led me to consider it as a small volcanic crater, yet few of these have hitherto been ascertained to exist in the Society Islands. It is remarkable that a stream of water flowing over the declivity of this elevated mountain abounds with eels and other fish, several varieties of which I saw sporting in the water.

Maurua, or Maupiti, is a small and comparatively elevated island about six miles in circumference, and its highest point about 800 feet above the sea. It is situated about fifty miles to the N.W. of Raiatea, and distinctly visible from the lower hills of that island. It is surrounded by a barrier reef of coral, at a distance of about three miles, which encloses numerous low islets covered with cocoa-nut trees, but the lagoon is too shallow to admit vessels exceeding one hundred and fifty tons burthen.

The island is composed of hills wooded to their summits and occasionally crested by cocoa-nut trees, but presenting rugged and mural cliffs to the sea coast, especially one rocky mass on the S.W. side opposite the opening in the reef, which rises 700 feet above the sea, resembling the ruins of a gigantic castle. Maurua is said to possess primitive rocks, but such is certainly not its general geological character; volcanic rocks, scoriæ, and slag abound; its smooth basaltic stones are much prized by the natives of all the Society group, to make pestles to prepare their food. The population of the island appeared small:* scattered habitations were along the coast, but the principal settlement is

* According to the census made by the missionaries in 1828, it contained 1000 persons.—ED.

on the S.E. or weather side of the island, which is also the residence of the chief Tairo: it contains a Christian church, in which a native teacher officiates.

Swine, fowls, and especially yams, are abundant; water is scarce. The natives were exorbitant in their charge for supplies and rather disposed to theft. This island is little frequented by foreign vessels; no ship before the Tuscan, in 1835, had visited it for two years.

Tubai, or Motou-iti, appeared small, low, and uninhabited; it is distant about thirty miles to the N.E. of Maurua, and is the most northern island of the Society group: we here had a westerly wind.

Huaheine, March 11, 1836.—This island is mountainous and fertile, and nearly surrounded by a coral reef; next to Tahiti it is the most frequented of the Society group; supplies are plentiful, and the bay of *Fare*, where is the chief settlement, on the N.W. side of the island, is safe and capacious, though not easily entered through the reef with the prevailing trade wind. Near Fare I noticed the venerable shaddock tree, covered with fruit, which was planted by Cook when he visited the island to restore Omai. It is the only tree of this species to be seen in the Society Islands, and all attempts to propagate it have failed. Coffee thrives in the gardens of the missionaries: population is said to be 1900.*

Tahuai-manú, or Saunder's Island, has at a distance much the appearance of a ship under sail; it is moderately elevated and the hills are wooded to their summits. It extends in a N.E. and S.W. direction, either extremity being low and covered with cocoanut trees. The island was formerly celebrated for its yams; it is now used as a penal settlement from Tahiti.

Sandwich Islands.—This archipelago of thirteen islands, eleven of which were first made known to the world by our own countryman, Cook, in 1778, is composed of eight moderate-sized islands, and of five small islets; it lies chiefly between 19° and 22° N. lat. and 155° and 160° W. lat.†

Woahoo or *Oahú*, May 16, 1834.—Anchored at the port of Honorúru, on the south-western side of this island, which has been too often described to need much notice here. The character of the country is mountainous, and its aspect naked and uninviting compared with Tahiti and the Society Islands. A lofty range of mountain, extending N.W. and S.E. throughout the island, separates the level land of the N.E. from that of the

* 2000, according to the census in 1828.—Ed.

† The population is estimated at 150,000—Christianity is the religion of the state—and they are under the pastoral care of twenty-three American missionaries. —See Williams's "Missionary Enterprises."—Ed.

S.W. coasts, which are again connected by elevated passes through the mountains; the most frequented, that of *Pari,* which stands at the head of the picturesque valley of Anuanu, is 1800 feet above the sea, and commands a beautiful and extensive view over the vale of Kolau, ten miles in extent, to the ocean on the N.E. side of the island. The structure of the island is volcanic, and many extinct craters are visible.

The settlement at Honorúru presents many striking instances of civilization. Supplies are abundant and reasonable: beef excellent. The Taro (*arum esculentum*) is plentiful, and forms the chief food of the natives. Many European vegetables are now commonly sold in the markets. As many as sixty vessels have been anchored in this port at the same time. A few weeks previous to our arrival a Japanese junk had been driven to the island in distress: the crew had suffered much from cold. They had probably been driven off the coast of Japan by strong westerly gales, carried to the N.E. till they met with northerly winds, which drove the vessel to the Sandwich Islands.

I had the gratification while here of meeting Mr. Douglas, whose subsequent melancholy death in Hawaii is well known, and of making several excursions in the mountains with him.

Maui, or *Mowee,* Oct. 3, 1835.—This island, seen from a distance on the northern side, presents the appearance of two elevated peninsulas connected by a low isthmus. It extends in a N.W. and S.E. direction about forty miles, and is separated from Hawaii to the S.E. by a channel twenty miles broad, and may be seen at a distance of ninety miles.* The face of the island exhibits the strong contrasts of luxuriant verdure and volcanic sterility so prevalent in this group.

The settlement of Lahaina or Rakeina is small, yet contains a very neat Christian church, a market, reading-room, &c. The population of the island is estimated at 20,000; the natives are intelligent, orderly, healthy, and well under the control of the American missionaries, who have great influence here.

Guadalupe, Nov. 20.—This island, bearing E.N.E., twenty miles distant, presented high land with two elevated peaks at its southern extremity. Its position, according to our observations, is in lat. 28° 54′ N., long. 118° 22′ W.; several charts place it thirty miles to the southward of this latitude.† It appeared about fifteen miles in length and about 1000 feet in height.

In lat. 19° N., long. 107° W., about half way between the group of Revilla-gigedo and the continent of America, a remark-

* This would imply an elevation of about 6500 feet.—Ed.

† Even in Admiral Krusenstern's excellent chart of the Pacific Ocean, it lies in 28° 34′ N.; it is corrected to its true position in his Supplement, yet given in his table of doubtful positions, p. 164. In Arrowsmith's Chart of the Pacific, it is in 28° 34′. —Ed.

able milk-white and luminous appearance of the sea was noticed at midnight all around as far as the eye could see from the mast-head, which lasted till daylight; nothing could be detected in the water to account for it, nor could any soundings be obtained.

In lat. 5° N., 103° W. long., the vicinity of land was suspected from the presence of amphibious birds and sea-weed, and in 6° 35′ N., 104° W., a pelican, about the size of a goose, and of a dusky brown plumage, took refuge in the ship and was captured. The nearest land was presumed to be Duncan's Island, of doubtful existence.* A female sperm whale, taken near this spot, contained a mature fœtus, which was anatomically examined: it was fourteen feet long by six feet in girth.

MARQUESAS OR MENDAÑA† group, Feb. 27, 1835.—The elevated land of Hood's Island, or *Fetúgu,* was seen bearing S.W. ½ S., distant about fifty miles.‡ On the following morning saw *Roapoa, Santa Dominica,* and shortly after *Santa Christina* and *San Pedro,* and anchored in Resolution Bay of Cook, or Port Madre de Dios of Mendaña.

Santa Christina, or *Tahuata* of the natives, extends in a N.N.E. and S.S.W. direction about ten miles; an elevated rocky ridge runs throughout the island, throwing off spurs to the east and west towards the sea, and thus dividing the lowland into distinct valleys, only accessible by land over the high hills which bound them. I obtained the native names of twelve valleys from Resolution Bay (Vaitahú) in order round the island. The soil is exceedingly fertile and covered with luxuriant vegetation; forests of bread fruit, cocoa-nut, and other fruit trees. The natural productions are much the same as in the Society Islands: the wild cotton is superior to that cultivated in many islands; the sugar cane abundant, large in growth, and of excellent quality: the palmyra, or fan palm, also grows here, although unknown in the Society or Sandwich Islands.

The population of Santa Christina is estimated at 1400 persons; the appearance of the natives robust and healthy, with handsome features. Each valley is under the dominion of a chief, who maintains feudal independence. At the time of our visit the island had been for some time in a state of profound peace; the natives were generally honest and well behaved, and our officers and crew associated and traded with them at the different valleys

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* Duncan's Island was so named in 1787 after the master of a merchant vessel. Lat. 6° N., long. 106° W. of Greenwich. See Krusenstern's Mémoires Hydrographiques, vol. ii., p. 58.—ED.

† Of this group of thirteen islands, extending 200 miles in a N.W. and S.E. direction, four of the south-eastern portion were discovered by Mendaña in 1596; one by Cook in 1776; the rest by the Americans in 1797, and by them called the Washington Islands. They were named Marquesas de Mendoza by Mendaña, out of compliment to Don Garcia de Mendoza, then Viceroy of Peru.—ED.

‡ This would suppose a height of at least 2000 feet.—ED.

without any unpleasantness occurring, and during my extended excursions over the country, I experienced every assistance, hospitality and kindness. Notwithstanding, however, the peaceful aspect of the people, it is the duty of every commander of a ship visiting them to be on his guard, since they are extremely capricious, and capable of the greatest outrages when least suspected.

Two missionaries we conveyed from England for this island were settled at the valley opening upon Resolution Bay with as much comfort as could reasonably be expected. They had found but little encouragement, however, in the disposition of the natives, who, though they had abolished open idolatry, retained the greater part of the prejudices and customs of their heathen state. The language of these people has some striking peculiarities, but partakes largely of both the Tahitian and Hawaiian dialects.

Resolution Bay, described by Cook, corresponds to the valley of Vaitahú. On the beach a stream of fresh water gushes from the face of a rocky cliff, and affords shipping a convenient and good supply of this essential. It is the same watering place indicated by Cook, and the flow is supplied by a mountain stream not visible in the vicinity of the coast. Eutiti, the principal chief of Vaitahu, is a shrewd and avaricious man, elderly and very corpulent. He is eager to encourage the visits of shipping to his port, since, through his traffic with them, and consequent acquirement of muskets, &c., he contrives to maintain considerable influence over the other chiefs of the island. This chief is the patron of our missionaries, and for the benefit of their cause it is to be wished he were absolute. The coast of Santa Christina is rocky, abrupt, and surf-beaten: no coral reef encircles and protects its shores, nor those of any other island of this group. Nevertheless, the detritus of coral is abundant on the beaches around the island. In return for supplies of live stock and vegetables to shipping, the natives alone require and value muskets and ammunition and tobacco. Of the muskets thus obtained they retain the best, and export the remainder to the neighbouring islands unfrequented by foreign shipping

Roapoa.—Hove to off Port Jarvis, on the west side, with good anchorage, to land three natives of the island who had accompanied us from Oahú, where they had been left by an American ship. Several canoes came off to the ship, and the natives expressed much disappointment that we would not anchor and trade with them. The principal native amongst them brought with him a written list of the ships that had visited the island, and a rough chart of the coast,* but who was the author of these

* Mr. Bennett has kindly presented a copy to the library of the Society. The chart is certainly a rough sketch, but it makes Port Jarvis on the N.W. side, with good anchorage in eighteen fathoms—wood and water.—ED.

MSS. I could not ascertain. The island of Roapoa appears to be nearly the same size as Sta. Christina, and equally mountainous, rugged, and bold. The summits of many of its mountains present conspicuous columns, spires or pinnacles of rocks. The land extends in a direction nearly north and south, and presents on the coast a succession of valleys of a highly fertile and picturesque appearance. These most prevail on the western side of the land, where several ports with convenient anchorage exist which have been visited by some few South Sea men, though the island is generally but little known or frequented. From Roapoa the island of *Noukahiva* is distinctly visible, thirty miles distant, and the islands of Sta. Dominica and Sta. Christina, at sixty miles distance, may be more faintly discerned. If it appears remarkable that Mendaña, in his discovery of the Marquesas, should leave Cook to discover Hood's Island, which is so very visible from the island of Sta. Dominica, it is yet more remarkable that Cook should have failed to discover the island of Roapoa, which on a serene day may be distinctly seen with the naked eye from the beach at Resolution Bay, Sta. Christina.*

Caroline Island, April 23, 1835.—This is one of the low coral islands† of the South Pacific, and situated by our observations in lat. 9° 58′ S., long. (measured from the island of Raiatea) 150° 18′ W. The entire island does not exceed four or five miles in circumference; it is circular, and composed of several connected, small circular peninsulas. A capacious and tranquil lagoon occupies the space within the land, and is bounded on a portion of its eastern or weather side by a barrier reef of coral, against which a heavy surf constantly breaks. The structure of the land presented no material but coral in all its varied forms. The greatest elevation of the soil did not exceed five or six feet, and the coral rocks and shelving shores betrayed the progressive receding of the ocean from the land it had so materially assisted to raise. Each compartment of the island was covered by dense vegetation of a highly verdant and pleasing character, some of the loftiest trees attaining the height of twenty feet. No collection of fresh water is visible on the island, though doubtless, as in many other of the low coral islands, much of good quality may be obtained from excavations in the sands.

The coast of Caroline Island is continuous, with a low and ex-

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* The distance is fifty-eight miles, which proves the elevation of Roapoa to be upwards of 2500 feet, and Santa Christina about 3000 feet above the sea.—Ed.

† Discovered by Broughton in 1795, in lat. 9° 57′, long. 150° 25′ W., and doubtless the same as Thornton Island. See Krusenstern, Mém. Hyd. Sup., p. 16. The island was also seen by Captain Willinck, in 1824, when in command of the Dutch corvette the Lynx; and he gives its position 9° 54′ S. 150° 9′ W. of Greenwich.—See Reize om de Wereld in de Jaren, 1823-4, van J. P. M. Willinck. Breda, 1836.—Ed.

tensive reef of compact coral rock stretching into the sea for a considerable distance, and thus extending greatly the actual compass of the island. A large extent of the reef is left dry at low water, whilst, when the tide is at its height, a boat may with care be floated nearly to the verge of the wooded land. From the single observation made during our stay, it would appear to be low water at 9 A.M. and high water at 2½ or 3 P.M.

Our landing from the boats was effected on the western side of the island. The boat was then conveyed across the level tract of fine coral sand, a distance of three or four hundred yards, and launched upon the waters of the central lagoon, which we crossed to the reef on its weather side, and discovered an aperture through the reef, which allowed our passing into the open sea and again returning to the lagoon without difficulty. The only quadrupeds we noticed on this island were mice. Upon a former visit to this spot (seven years previous to our visit) Captain Stavers had landed some hogs, but no traces of the present existence of those animals on the island were visible to us. Many boobies had constructed their nests in the trees; and white terns, frigate birds, curlews, a species of totanus, and small pigeons with white heads and brown general plumage, were also numerous.

Fish were abundant in the waters around the island and also in the lagoon, but not easily obtained on account of the voracity of the sharks. Bêche de mer abounded in the shoal water, and some few pearl shells were noticed in the lagoon. The character of the vegetation of Caroline Island accorded with that on the shores of the Society Islands. The wood-land was chiefly formed by the shrubs of *Tournefortia*, which were in full flower, and emitted a fragrance perceptible at some distance from the lee side of the island. We found but one tope of rather dwarfish cocoa-nut trees, and that at its south extremity near the margin of the lagoon. The quantity of fruit the trees produce is great, but the nuts are small, and the fluid they contain often of brackish taste. That some ship had latterly visited the island was evident from many of the cocoa-nut trees having been cut down to obtain more easily their fruit, a practice often dangerous, when these trees afford important landmarks to navigators, and at all times selfish and mischievous, and more peculiarly so here, where cocoa-nut trees, although increasing in number, are as yet but few. The only service Caroline Island can afford to shipping is the supply of cocoa-nuts, fish, and fire-wood.

Christmas Island.—This is an extensive coral island, dangerous of approach, and well known as the spot on which Cook, in his third voyage in 1777, landed to observe an eclipse of the sun. We coasted round about two-thirds of the island, and it appeared to us to be more than sixty miles in circumference, which is the

extent given by Cook, and to be of a triangular form rather than a crescent, with its base to the N.W. The western point of the island projects some distance and is covered with cocoa-nut trees, giving it a cheerful aspect. We landed and procured two boat-loads of the fruit—no fresh water to be found; quails were numerous, as also the peculiar boobies mentioned by Cook; lizards, land and hermit crabs, abound. The *Sida* here grew abundantly, which we had not noticed at Caroline Island. We found about fifty fine cocoa-nut trees laid prostrate by fire and axe, the mischievous work of some reckless sailors; yet the increase has been great, as Cook records only thirty to have existed at the period of his visit. The yams, melon, and cocoa-nuts planted by Cook on the islet at the entrance of the lagoon have all disappeared. The position of this islet, his place of observation, is 1° 59′ N. lat., 157° 30′ W. long.

Bunker's, or *Jervis Island*, May 13, 1835.—Three days after leaving Christmas Island, and by our calculations 228 miles S.W. of it, in lat. 0° 20′ S. long., 160° 31′ W., measured from Raiatea, we fell in with a low and narrow island, extending east and west from three to four miles in length, composed of sand and coral, and destitute of vegetation; the centre of the land was slightly raised by a confused assemblage of masses of blackened coral; the beach of white sand was coasted by a heavy surf. It appears doubtful if this is Bunker's or Jervis Island; our position would agree best with the latter, but does not coincide with either as laid down in our charts.* This is a dangerous shoal for ships, and should be cautiously guarded against, as even by daylight it only presents at a short distance an indistinct white line, and the birds are not remarkable in number or character. Some years since the Mary, English South-seaman, ran ashore on Jervis Island, and was lost, her crew residing on the sterile land until rescued by a passing ship.

It is much to be lamented that the positions of these various islands scattered over the Pacific Ocean, which is traversed in

* Captain Browne, of the English ship Eliza Francis, discovered, on the 21st August, 1821, a small island, five miles in circumference, and covered with bushes, and determined its position to be 0° 23′ S. lat., 159° 46′ long. W. of Greenwich, which is probably the same island called by the Americans *Bunker*. There is a difference of forty-five miles of longitude between the position of this seen by Mr. Bennett and that of Mr. Browne; but as the latitude is nearly the same, there can be little doubt they are the same island. But *Jervis* Island, although in nearly the same latitude, lies 10° farther to the westward, according to Krusenstern's Atlas of the Pacific Ocean; yet this position is very doubtful; and any master of a South-seaman, or other vessel frequenting these seas, will render an important service to hydrography by fixing and making public the position of this or any of the numerous islands whose situation is marked doubtful in our charts. Arrowsmith's Chart of the Pacific, 1832, gives Jervis Island in its correct position, as determined by Captain Browne.—Ed.

every direction by British shipping, should not be determined by some competent authority: it is a point of much importance, and in which many valuable lives and much property are deeply interested.

Dec. 12, 1835.—Saw land bearing N.N.E. fifteen miles, which consisted of a group of three islands extending in an east and west direction, of moderate size, rugged, elevated, and apparently rocky and barren. By our observations this group lies in 24° 9′ N., long. 112° 39′ W., but no land is laid down in our modern charts in this position. A chart of ancient date places three *Lobos* Islands ninety miles to the northward of this spot, and an ordinary map of North America of 1814 places islands in the vicinity under the name of *Celisos*.* Upon our arrival at Cape St. Lucas we were informed that the existence of these islands had been announced, and that some small vessels in quest of furs had endeavoured to visit them but without success. It is remarkable that, situated as they are in the direct route of shipping making Cape St. Lucas, a route annually followed by numerous South-Seamen, they should have remained so long unknown. From the situation and character of the islands, it is probable the fur seal abounds on their shores.

California, Dec. 15.—Hove to off the mouth of a bay between Cape St. Lucas and Cape Palmo, the southern extremities of the isthmus of California, where is a small grazing settlement which supplied us with excellent beef, poultry, and cheese. The land about Cape St. Lucas, which forms the S.W. extreme, is bold, rugged, and mountainous; the lowlands appear flat and sandy. The settlement on the shores of the bay is a little to the N.E. of the Cape, and the bay affords a fair roadstead with seventeen fathoms water at half a mile from the beach, but open to the S.E. gales, which are very severe. The tide here is regular, with a rise and fall of five or six feet. The level plain which opens on the bay is about thirty miles deep by ten in breadth; it is chiefly covered with brushwood. The vegetation afforded some splendid specimens of cactus, rising as a distinct and fluted column to the height of from twelve to fifteen feet. Shipping may here procure fuel, water, and provisions; a bullock costs from five to ten dol-

* In Krusenstern's and in Arrowsmith's Chart of the Pacific Ocean the Lobos Islands are laid down in 25° 50′ N., and 114° 30′ W., or 150 miles N.N.W. of this group. The Celisos, above mentioned, strange as it may appear, is most probably a corruption of A lejos, signifying "in the offing" or "afar off," and which is laid down in Krusenstern's Tableau des Iles Problematiques in lat. 24° 50′ N., long. 115° 30′ W. of Greenwich, as rocks having been seen in 1791. The group seen by Mr. Bennett is only fifty miles S.W. of Cape San Lazaro, on the isthmus of California, within thirty miles of Vancouver's track in 1795, and within twenty miles of Colnett's in 1793.—Ed.

lars. The residents are about thirty persons, and the whole farm belongs to one person: their commerce is confined to the English and American South-Seamen who visit the bay for supplies. Red and white granite enters largely into the composition of the mountains which bound the plain; close in with the land I obtained a species of sea weed exactly resembling the sargasso or gulf-weed (*Fucus natans*) of the Atlantic. A current was experienced setting to the east.

May 26, 1836.—In lat. 2° 30′ S., long. 175° 10′ E., discovered a low and extensive island covered with cocoa-nut and other trees; sandy beach and little surf; some smoke seen would lead to the idea that the island was inhabited. This island was supposed to be Hurd's or Rotch's; if the former, it is, by our observations, laid down on the chart 3° to the eastward of its true position, as given above.* In 2° 53′ S., long. 174° 55′ E., observed a remarkable line of froth on the sea, some yards in width and of great extent, and accompanied by a mass of dead birds, fish, shells, drift wood, &c., which seemed to indicate the limits of a current, and in fact we found that after entering it we lost the strong N.W. current that had hitherto accompanied us.

Tench's Island, June 13.—This island appeared low, and small, and wooded, but conspicuous from its groups of tall trees rising above the underwood. Passed Mathias Island, discovered by Dampier in 1700, and on the 27th June got sight of the dark and elevated mountain land of New Guinea; steered through the Gillolo passage, and on the 17th July anchored off the Malay village of Sutranha, on the western side of the island of Timor. Here may be procured supplies of fuel, water, and provisions. After a week's stay here we sailed for the Cape of Good Hope, which we rounded on the 12th September, touched at St. Helena, sighted Ascension and Flores, and on the 20th November, 1836, entered the British Channel, after an absence of three years and twenty-four days.

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* *Hurd* Island, in Krusenstern's Mém. Hyd., is given in 2° 43′ S., long. 177° 0′ E., as discovered by the Elizabeth in 1809; and *Rotch* Island in 2° 30′ S., 176° 10′ E., discovered by Captain Clerk, of the John Palmer, in 1826: it is probably the latter island that was seen by the Tuscan, as the latitude agrees exactly, although there is a difference of a degree in longitude. See Krusenstern's Sup. Mém. Hyd., pp. 3 and 19; Arrowsmith's Chart of the Pacific corrected to 1832, in nine sheets, places *Hope* Island in the position of Hurd Island of Krusenstern and Rotch's Island as above.—Ed.

XIX.—*Some Account of the I'liyáts, or Wandering Tribes of Persia, obtained in the Years* 1814 *and* 1815. By James Morier, Esq., F.R.S.

It has been affirmed by several well-informed Persians, that perhaps one-fourth of the population of Persia consists of wandering communities, forming an almost distinct class by the nature of their habits and their modes of gaining their livelihood. We will first investigate their origin, then look into their present condition, observe how they are governed, how they contribute to the strength of the state, and then remark upon the advantage to which they might be turned as military bodies.

The I'liyáts* in general are not original Persians, but may be compared to foreign shoots grafted upon the main stock. The original Persian is to be found in the cities, and in the old-established towns and districts of the provinces. The accretion of new population flowed in both from the east and the west. Until the conquest of Persia by the Saracens (A. D. 651), her people might be said to be unmixed. They having conquered the country, spread themselves even to Balkh, Bokhárá, and Merv, were incorporated with the Persian nation, and, it is said, first inoculated it with roving propensities. The next tribe of wanderers was brought from the eastward, in 1234, with Jengíz Khán, which was followed by Tímúr, who crossed and re-crossed Persia so frequently, that many of his hordes were even left in Turkey, where they exist to this day under the name of *Yúruk* [wanderer].

Such in general terms may be called the origin of the I'liyáts, but each tribe has its own particular history, recording whence it came, and by whom it was introduced into Persia. Many have become inhabitants of cities and villages, therefore the tribes are classed into what are called *Shehr-nishín,* or dwellers in cities, and *Sahrá-nishín,* or dwellers in the field A few only have adhered to their original modes of life, and abide all the year round

* I'liyát and I'lát (Memoirs of Abdu-l Kerím, by Gladwin, p. 29) are the Arabic plurals of I'liyah or I'lah, singulars formed from the Turkish word I'l, or its derivative I'lí. I'l, and consequently I'lah, signifies a family or tribe, and is synonymous with the Arabic word 'ashírah, used for "tribe" by the Kurds. Hence, it may be remarked, the names of several Turkish provinces, I'ch-íl, Hamíd-ílí, Khójáh-ílí, Rúm-ílí, &c., mean the country inhabited by "the Interior Family," or tribe of Hamíd, Khojah, the Romans, &c. The first writer who speaks of the I'liyát, under the name of *Elli,* is the learned Jesuit, Villotte (Voyages d'un Missionaire, Paris, 1730, p. 112). Accounts of them are also given by M. Rousseau (Notice Historique de la Perse), Sir J. Malcolm (History of Persia, vol. i. p. 502), Sir W. Ouseley (Travels, vol. i. p. 307), M. Jaubert (Voyages, 240, 241, 250-256), Malte-Brun (Précis de la Géographie, vol. iii. p. 280), and M. Dupré (Voyage en Perse, Paris, 1819, vol. ii. p. 452).—F. S.

in tents, in the winter keeping to the plains, and in the summer, seeking the pasturage of the mountains. In their own estimation, they look upon the *Shehr-nishíns* as degenerate, applauding the hardihood and simplicity of manners of those who have no other dwelling-place than the tent, and reviling those who recur to the luxuries of a house and the protection of a city.

The principal tribes are as follows :—

1. The Ḳájár.* This is the tribe of the present king of Persia, and takes its origin from Turkistán. It came into Persia with O'gúz Khán, grandson of Jengíz, and branches of it have taken root in Ḳazwín and the territory of Eriván. There is a popular notion, however, that its origin is from Damascus, and the circumstance which calumny has evidently added, that many of the tribe formed part of the army of the hated Yezíd, who killed their beloved Imám Ḥuseïn, helps much to increase the odium in which they are held. They are subdivided into six smaller families, viz.: Kavánlú, Devehlú, Shámbeyátí, Yóḳárí-básh,† and Ḳájár Ḳazvíní. The king's family is of the Ḳavánlús, and his mother of the Yóḳárí-báshes. They do not count altogether more than 400 houses, or, as they are called, *Khánehwárs*,‡ and their chief place of residence is Aster-ábád and Ṭehrán. Some few are at Eriván and Merv, and generally at all places governed by a Sháh-zádeh, or king's son. They are all *Shehr-nishíns*, or dwellers in cities. Their old wandering habits, however, break out in the spring. Fat-h 'Alí Sháh invariably quitted his winter quarters, or *ḳishláḳ* of Ṭehrán, and proceeded to his *Yaïláḳ*, or summer quarters of Ṣulṭáníyeh, O'ján, Fírúz Kúh, or Cheshmeh 'Alí, as suited the humour or necessity of the day, and there spread his camp and his cattle over the surrounding pasturages.

2. The Afshárs. They call themselves originally of the Turkomán tribes, and are divided into two principal branches, Shámlú and Ḳirḳlú.§ This is a large tribe, and counts altogether about 20,000 houses, but it is not held in high estimation by the king, who does not willingly give their members places of confidence about his person, perhaps owing to the ancient grudge handed down in his family against the famous Nádir, who was an Afshár, and who killed Fat-ḥ 'Alí Khán, their ancestor, the first powerful chief of the Ḳájárs. Nádir was of the Ḳirḳlú, and they who are famous for their vaunting, do not pride themselves a little upon their affinity to so great a conqueror. They principally reside in towns, and are to be found in the greatest numbers at

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* Probably Káchár, (fugitive,) from their attack flying.—F. S.
† Upper-head.—F. S.
‡ Kháneh is now pronounced Khóneh in Persia.—F. S.
§ Forty-ers, from Ḳirḳ, "forty."—F. S.

Abíverd, the birth-place of Nádir, and at Kelát, the place he so carefully peopled and strengthened.

3. The Arabs. This tribe is originally from the province of Nejd, in Arabia Felix, and its descent is of the purest Arab blood. In the reign of Sháh Ismá'íl, it is said that from 2000 to 3000 families were transported from that country to a tract of pasture ground to range over from Ardistán to Herát and Meshhed, in which they have increased to about 6000 tents. They more particularly retain their pastoral habits, and are almost all *Ṣahrá-nishín*, or dwellers in the plains. They are of the Sunní sect, and partly preserve their language, although they have changed their national costume. Their principal and purest branches are the *Manṣúrí, Amerí, Khezäi, She-bází, Dobeïsí, Zangí, Meïshmest, Karäi, Kelábí, Baserí*, and *Nakhí*.

4. Lak.* This is a very large tribe, subdivided into many families; they are Persians, and tradition teaches them to date their origin from the Kaïanian dynasty, Kaï in ancient Persian or Pehleví meaning either a great king or a giant. The Zends, the tribe of the famous Ḳerím Khán, are Laks, and one and all are renowned for being thieves. They are much dispersed throughout Persia, but their principal seats are about Ḳazvín, and in the provinces of Fárs and Mázanderán. Their chief families are the Beïránavend,† Khójahvend,‡ Nadávend, Nakavend, Jelílawend, 'Abdu-l-melikí, and Siyáhvakhshán. Part of this tribe look upon 'Alí as God, and are called *Naṣerí*, from the name of their chief, who, they say, first gave rise to this doctrine. It is affirmed that Moḥammed, the false prophet, sent Naṣerí, one of his friends, to accompany 'Alí to the wars—that when they reached the Shaṭṭ, or the Euphrâtes, the latter sent Naṣerí to reconnoitre the stream, and inquire of the fishes where was the ford. An ancient fish replied, "He who sent you to us also knows the ford." Upon which Naṣerí returned, and exclaimed, addressing 'Alí, "You are God!" 'Alí at that instant killed him, but brought him to life again. "Now I know for certain that you are God," said Naserí; and thus commenced his belief. They are also called 'Alí Iláhí, or 'Alí-God-men, and do not acknowledge the supremacy of Moḥammed. They have books

* Called *Lek* by M. Jouannin (Extrait d'un Itinéraire en Perse, par M. [Rousseau,] Paris, 1813, p. 9). *Lek* and *Lak* are spelt with the same letters, but differently pronounced in different provinces. They are the third division (ḳism) of the Kurds, otherwise called Kelhorán (Jehán-numá, p. 449).—F. S.

† It is probable that branches of the same tribe may have been affiliated in the different divisions of the Kurds, for the Beïránevend are placed in the French List (p. 9) among the Písh-kúh Lors.—F. S.

‡ The Khójahvends and Bayáts are I'láts, and speak the Turkish language (Malte-Brun, vol. iii. p. 287).—F. S.

of their own, and acknowledge a Pír,* or saint, in whom they place great faith. Their total numbers are reckoned at about 20,000 houses, and they live partly in cities and partly keep the plain.

5. Feïlí. This is the most numerous tribe in Persia, and is the more formidable from being collected in one region, not dispersed, like most of the others, in small detachments in different parts, but living compact and united. It consists of 100,000 houses, which occupy the western side of the mountains of Luristán, the territory of Shúster, Dizfúl, Havízeh, the banks of the Kerkheh and the Kárún, and are mostly Sahrá-nishíns. Some part of this tribe have retired to the mountains to a place called Pasht Kúh, which may be rendered the "back of the mountain," where taking advantage of the inaccessible position of their dwelling-places, they profess to be independent of the government.

6. Bayát. This is a small tribe, calculated at about 1,000 houses, which originated in Turkistán, and is dispersed in towns and cities through different parts of Persia.

7. Kurd. These are branches of the same people who inhabit the mountains on the frontier of Turkey, and were brought by Sháh Ismá'íl from Kurdistán, and settled on the eastern frontier of Persia, to check the inroads of the Turkománs. They then consisted of 4,000 houses, which now have increased to 50,000. They are formidable both on account of their numbers and bravery. They retain much of their language,† although they have quitted their characteristic dress, and adopted that of Persia. Their principal places to the eastward are Burujud,‡ Khábushán, Isferáyin, Chinárán, and Derejez. Many live in tents and some in houses. They are subdivided into Shádílú, Kará-cherchlú, and Yezídís, and are still famous for their thieving and plundering talents.

5. Kurd Bacheh, or Kurdish Children. This small tribe has arisen from an intermixture of the Kurds and Laks. The I'liyáts do not intermarry without the permission of their Elders, without which precaution murder and bloodshed frequently take place among them. In this instance the intermarriages took place by the mutual consent of both parties, whence sprung the Kurd Bachehs, or the Children of Kurds.

8. Aïmák. These are Sunní in religion, and of an Afghán origin, though some say they originally came from Turkistán.

* Pír, *i.e.* senior, and technically, spiritual superior, saint.—F. S.

† The Kurd tongue is an ancient dialect of the Persian, as appears from Father Garzoni's Grammatica Curda, Roma, 1787.—F.S.

‡ Bujnurd (Fraser).—F. S.

They consist of about 50,000 houses, and are all Ṣaḥrá-nishíns. Their chief places of residence are in the southernmost parts of Khorásán, near Kará Kháf and Bakhez. They are in great measure indentified with the Hezáreh.

9. Hezáreh. This tribe is called 50,000 houses in number, and live in the neighbourhood of Ḳandahár and Kábul, and in Sístán. They are Afgháns, and live in towns and villages.

10. Balúch. These live mostly in tents, and are calculated at 3000 to 4000 families in the S. of Persia.

11. Bájibān. Two hundred houses.

12. Khodábendehlú, or, the Servants of God. They acknowledge 'Alí for God; consist of 1,000 families, live for the greatest part near Ṭehrán, and call themselves of old Persian origin.

13. Bakhtiyárí.* This is a tribe of mountaineers, who inhabit the high lands of Lur, and are remarkable for being a brave, hardy race of people. They calculate their numbers at about 100,000 houses, and the account which they give of themselves, is that they came from Rúm (a general word for Turkey) and that they are not of Persian origin. Their language has much of the old Fársí in it, and has great affinity to that of the Laks. The tribe is mostly spread in the *Yaïláks* and *Kishláks*, that is, summer and winter quarters, from Kirmán to Kázerún, and from Ḳom to Shúster. They live in villages of about twenty to thirty houses each, in difficult nooks of the mountains wherever they can get water and grass, and some establish themselves in caves of remote and dangerous access. It is remarkable that at a burial, they make the same rejoicings as the Persians do at a wedding. They collect together, and dance round the grave to the sound of music and singing. Should the man about to be buried have been killed in battle, they rejoice the more, for then they look upon his death as *halál*, or guiltless. Should he die away from his own house, his relations set up a cœnotaph, place his cap, arms, and other effects upon it, and dance as before. Their principal stronghold is about two posts from Dizfúl, shortly called *Dez*, but in the Bakhtiyárí dialect *Dezimiyúnedezú*,† and it is represented as situated in the middle of a long, narrow defile, which it commands. It was here that a famous rebel chief, Asad Khán, in the year 1813, took refuge, and surrendered himself afterwards to Moḥammed 'Alí Mírzá, the governor of the province. The Bakhtiyárí are now divided into two principal branches, the *Haft Leng* and *Chahár Leng*, which again are subdivided into many *Tús*

* The Bakhtiyárí are Lurs, or Lors.—F. S.
† Dezí míyáneh Dezú; Dez, mid-way between the two Dezes?—F. S.

or Shafts. *Leng* in their dialect means foot, and the origin of the above designations, was, it is said, produced by a demand made on the tribe in ancient times for military contributions in men and horses. One part of the tribe, the *Haft Leng,* or Seven Feet, was taxed in one-seventh proportion, whilst the *Chahár Leng,* or Four Feet, was taxed one-fourth. Their property is calculated by numbers of horses; thus when in one case seven feet, or one horse and three quarters, was levied, the other only contributed four feet, or one horse. The Bakhtiyárí pride themselves much upon their hospitality, and assert that any one of their old women would go the length even to sell herself for a slave, rather than that a guest should want food. But, it was said at the time that this information was received, that the whole tribe was at variance among themselves, and my informer asserted that he himself had received sixteen wounds in various affrays in which he had been engaged in the Mejlis, or assembly of his relatives. They are so prone to rebellion, that if assisted from abroad, it is said, they would never submit to the dominion of Persia, for they assert decidedly, that they are not of Persian origin. They do not like the presence of strangers, and are not difficult in robbing them, whenever they fall in their way. They are true to their Kháns, and will espouse their cause whenever called upon so to do. The Sháh has con-consequently many families of them in separate villages about Tehrán, as hostages for the good behaviour of the remainder, and retains 2000 in his pay as *Sarbáz,** or disciplined soldiers.

14. Shekágí.† This is a large tribe, said to consist of about 50,000 houses, principally inhabitants of the northern province of Ażerbaïján, and are dispersed over the districts of Hasht-rúd, Germ-rúd, Miyáneh, and Ardebíl. The late Prince 'Abbás Mírzá drew from them the greatest part of his infantry, disciplined after the European manner, and very good soldiers they are reputed to make, if properly managed. Their language is the Turkish.

15. Sháh-seven. The principal members of this tribe are in Ażerbaïján; they are also in numbers about Tehrán, and live mostly in tents. Nádir Sháh dispersed them throughout different parts of Persia. Their present force is calculated at 20,000 families. About 100 Sháh-sevens are Gholáms, or privates in the king's service, performing the duties of body-guard; their language is the Turkish,‡ and their origin from Turkstán.

16. Memacenni. This tribe is remarkable for the resemblance of its name to that of the Memaceni, mentioned in Quintus

* Sar-báz, literally a man who sports with his head, an *enfant perdu.*—F. S.

† Probably Shaghághí. See Malte-Brun, vol. iii. p. 288.—F. S.

‡ As is their name, signifying "love king."—F. S.

Curtius (lib. vii. c. 6) as the opposers of Alexander.* They pride themselves upon their antiquity, say they are the descendants of Rustam, that they came from the province Sigistán,† and preserve their original wildness and independence by keeping almost constantly to the wilds and fastnesses of Fárs, and being the interrupters of the public security, by their repeated attacks upon travellers. Two of the principal *tir* are the Rustamí and the Zálí.‡ Their principal haunt is the Kal'eh Sefíd, or the White Castle, on the confines of Mardasht, a strong position on an almost inaccessible hill, on the summit of which they have their habitations, and pursue their agriculture. Their numbers are calculated at ten to twelve thousand houses. They are great admirers of the Sháh-Námeh§ of Firdausí, and pretend to have a history of their own, which, however, no one has ever yet been able to procure.

It does not appear that any of the tribes have written records, and it must be confessed that the information here acquired concerning their numbers, must be held as very uncertain, such a thing as a census of the population or a register for births and deaths being unknown in Persia. The traditions of the tribes are oral, and whenever they pretend to great antiquity, they immediately ascend to the fabulous ages of their historians, where all is darkness. I have not heard of their possessing any popular ballads, which can throw light upon their history. Each tribe has a patois of its own, bearing more or less affinity to the Persian, but whatever books they possess, are in the Persian language.

The different tribes are now so much spread throughout the provinces, that they have almost lost that union which could render them formidable. It is evidently the policy of the government to disperse them, and it does so, keeping their chiefs as hostages about the person of the king. Great efforts have been made to disperse the Arab tribes, but ineffectually; consequently their chiefs are feared, and precautions taken to secure proper hostages for their good behaviour.

Such of the tribes as have become inhabitants of cities, are subject to the laws and regulations which rule the community they have adopted—generally speaking they are employed as servants, attached to their Kháns either in a military or domestic capacity.

The Sahrá-nishíns, although taxed in various ways, and made to contribute to the military exigencies of the state, are compa-

* Alexander was then near Maracanda (Samarkand). The resemblance is probably apparent, not real; as *Memakeni* (the name given in Quintus Curtius) and *Memacenni* differs by one and that a very different letter, and the former were far from Persia.—F. S.

† Also called Sigistán, Siyistáu, or Sistán.—F. S.

‡ Zál was the father of Rustam, hence these Rustamians and Zalians.—F. S.

§ Sháh-námeh, *i.e.* Book of Kings, the great heroic poem containing the history, or rather legends, of the ancient kings.—F. S.

ratively less molested than the other inhabitants. Their wealth consists principally in cattle, which yields them a considerable revenue, and which they prefer to that produced by the cultivation of the soil. They breed camels and horses for sale, and their sheep yield milk, which is made into raughan (liquid butter), and sold throughout the country. The peculiar privileges of the I'liyáts consist in liberty to range over districts from which no one can dispossess them. They ascend in the summer to cold regions called *Yaïlák*, where they find pasture, and in the winter keep to their *Kishlák*,* tracts which enjoy a warmer climate. These Yaïláks and Kishláks, are defined to each tribe by the government, and whenever their limits are encroached upon by unprivileged tribes, violent strifes and battles ensue.

The existence of these migratory tribes being advantageous to the government, they are little oppressed. They are taxed at certain established rates upon each head of cattle, and are called upon to serve in the king's armies. They pay at the rate of five piastres for each camel, one piastre for each cow, the same for mares, one 'abbásí or quarter-piastre for a sheep. When they cultivate the ground, they are fined according to the rates exacted from the other Rayahs.† Should they not be cultivators, each ten Khánch or houses provide one horseman mounted and armed; and each five, one footman, or Tufenkchí.‡ These receive forage from the Sháh. The horseman's pay is about eight túmáns § annually, for which he serves six months in the field, the other six he remains at home. He is paid twice in the year, half and half, in advance, and during the time he is in actual service receives a daily allowance of one man barley for his horse, and straw in proportion. The horsemen are obliged to attend the muster and the review, which the king makes after the Nau-Rúz,|| of all his troops, properly mounted and equipped, or they are severely punished. The *Tufenkchí*, or foot-soldier, get seven túmáns per annum, and half the year remains at home. The wages are paid into the hands of the Khán of the tribe, who then delivers over the money to the subaltern officers, called Sultáns and Bín-báshís,¶ who pay

* Also written Yaïlà and Kishlá; these are Turkish words, belonging to the Jaghatáï, or Chaghtáï, the ancient dialect spoken by the Moghols and Tátárs.—F. S.

† Rayáh is the common Turkish abbreviation of ri'ayyah, *i.e.* tributary: the same word is often pronounced ri'ayyat, and thence spelt *ryot* by Anglo-Indian writers.—F. S.

‡ A Turkish word now much used in Persia and India. It signifies "a musqueteer."—F. S.

§ 6*l.* 8*s.*, a túmán being about 16*s.*

|| "New-day," *i.e.* New-year's Day; a great festival held at the Vernal Equinox.—F. S.

¶ Thousand-heads, Bíng-báshí in the Constantinopolitan Turkish, often pronounced Bimbáshí by the Persians and Arabs, but the last letter is sághir nún, *i.e.* *ng*, not *n*.—F. S.

the soldiers. This promotes peculation. The Khán subtracting his share, the Mírzá or scribe his, and the subalterns theirs, while the poor soldier deems himself very lucky if he gets one-half of that which is his due. Aghá Moḥammed Sháh, the eunuch-king, used to pay the troops with his own hand. The great advantage of being military servants, is protection to their families; the governors of villages and other men in office, not daring to molest them under such circumstances.

The Íliyáts are not compelled to bestow their labour upon public works, like the other Rayahs—they keep exclusively to their tents, and tend their cattle. The taxes they pay, are levied by their chiefs, who account with the government. Those who are inclined to elude taxation, frequently do so by secreting their cattle in the mountains.

In their different small communities, they are governed by Rísh-sefíds (literally, White-Beards), or Elders, who have no other emblem of power or superiority to show than a white beard. Old age is extremely respected by them, and generally by all Persians, and is indulged with great liberties. A Rísh-sefíd, a poor miserable old man, will not fail whenever his tribe is oppressed, to make a journey purposely to remonstrate with the governor of the province, and abuse him to his face; and so careful are the governors not to offend these influential persons, that they bear their reproof with moderation, and are fain to be civil. Their disputes are decided by their Rísh-sefíds; even the ordonnances of their Hákims, or governors, are referred to them. In all cases of marriage, the Elder is first consulted, and his consent procured as a preliminary. The tribes seldom intermarry—the Elders recommend families whose daughters may be selected for wives; but whenever one tribe refuses to give their daughters in marriage to another, it is esteemed an affront, and a motive for strife.

The Persian government is ever jealous of the migration of these tribes, and they cannot remove from one province to another without first having obtained the Sháh's permission. In times of trouble, such as the death of the king, frequently, if they be strong enough to encounter opposition, they pass from their old haunts to better places.

We have said before that the possessions of the Íliyáts consist of cattle. There are camels, horses, mares, cows, oxen, mules, asses, sheep, and goats, beside a fine race of dogs. Their pastures, although open to the Sháh, the princes, and other great men of the country, may also be said to be their property, inasmuch as they have liberty to range over them, unless there has been issued a kúrúk or prohibition.

From the pastures which are appropriated to the use of the

Sháh and the princes, such as Sulṭáníyeh, O'ján, &c., they are totally excluded, unless they receive permission, for which they pay a certain quantity of the produce of their flocks. For instance, in 1815 the Sháh did not go to Sulṭáníyeh, and he allowed the I'liyáts to feed their cattle there, provided they furnished him with 1000 mans of *raughan*, or preserved butter.

Their property, if it may be so called, consists in tents, carpets, bedding, cooking utensils, large cauldrons in which they boil the raughan, or preserved butter, skins to shake the butter and sour milk in, and all the rude furniture of shepherds. Much of their furniture consists of camel pack-saddles, ornamented bridles for the chief camel, besides other ornaments in beads, &c. Among the Kurdish tribes the women ride in *kajáwehs*,* which are cage-like panniers placed on each side of the camel, each large enough to contain a woman. Then there are saddles for horses, and *páláns* † for mules, and a sort of padded cushion for the back of their oxen, to which they lash their tents.

An *I'liyát* of middling fortune possesses about a hundred sheep, three or four camels, three or four mares, ten asses, &c., which may yield him a revenue of forty to fifty túmáns.‡ A man who possesses a thousand sheep, thirty camels, twenty mares, &c., is reckoned a rich man. Each sheep may be valued at two piastres, a camel at ten, a mare at eight, an ass at three. Such a property would yield a revenue of four hundred túmáns.§ This is derived from the wool and milk of sheep, the wool and hire of the camels, the colts from the mares and asses; the female camel brings forth once every two years, the mare every year, the sheep once. In some parts of Persia, particularly among the Kurds, who enjoy the finest pasturage, the ewes produce twice a year. There are a few rich Persians, whose possessions and modes of life assimilate to those of the patriarchs of old. Such was 'I'sa Khán, of Turbet, who was calculated to possess 160,000 sheep, 20,000 camels, 6,000 mares, and other cattle in proportion. Ahmed Khàn, of Marághah, was also an immensely rich farmer. The Wálí of Sehnah, and several others, might also be classed among those leading patriarchal lives.

The patrimony of an I'liyát is divided among his children, according to the Muselmán law: two-thirds to the sons, and one-third to the daughters, the latter taking the clothes and valuables belonging to the mother.

* Or Kajábah.—F. S.

† Pronounced pálún, according to the mode of sounding the final án, prevalent in Persia for at least a century and a half (Kœmpfer, Amœnitates Exoticæ, Preface p. ult.)—F. S.

‡ 35*l.* to 43*l.* 15*s.*—F. S.

§ 350*l.*

The value of an I'liyát tent is about six to seven túmáns. It is made of goats' hair, consisting of cloths about a foot and a quarter in width, wove by the women. All the members of a family, men, women, and children, are usually employed spinning goats' hair, which is either in actual use in the loom, or laid by for sale. They weave the cloth in a portable loom, which they fix in the rudest manner possible, but which answers all the purposes for which it is intended. This cloth is of strong texture, impervious to rain, and will last twenty years. The covering of one of the tents is generally about forty feet in length, and twenty in breadth, and is erected upon a range of poles, the back and sides being fitted up with reeds made into walls, and is fastened to the ground with pegs. The tents are extremely rude, and do not show any appearance of attention to comfort. In Ażerbaïján and the more northern, and consequently rainy countries, they have another sort of tent, which has been borrowed from the Turkománs. This consists of ribs united, and, when open, is like a cage, on which thick felts are thrown, and it is entered by a narrow door. It is called alájeh;* the goats' hair tents are called *ḳarah cháder*, or black tent.

The encampments of the I'liyáts are generally of about twenty to thirty tents together, which they pitch mostly without any great attention to regularity. They are also to be seen in a circle as well as in line, and appear conspicuous on a light soil, owing to their black colour; on a dark soil they are scarcely perceptible, particularly under the shadow of a mountain. The tents are close to each other, but the different encampments may be a mile or two asunder, according to the convenience of grass and water.

The I'liyáts feed principally on the produce of their flocks, and eat sour milk, cheese, dough or butter-milk, and much raughan, or preserved butter. Their annual expenses are much less than those of the inhabitants of cities; for, excepting their clothes, copper utensils, pack-saddles, and ornamental luxuries, they supply all their own necessities. Their simple manner of living (not to mention their being out of the way of extortion) may be calculated at one hundred per cent. cheaper than in the town. They make their own tents or dwelling places, weave their own carpets and hammocks or felts, cut their own wood, and burn their own charcoal; they kill their own meat, make their cheese and butter, and their lives are far more free from disease and local complaints. Their dress does not differ from that of other Persians, except in its extreme meanness. A man rich in cattle, will appear with a coat to his back that scarcely holds together, and in such indifferent dresses, but with no other covering over

* Or álájaḳ, "a portable hut,"—a Chghatái term.—F. S.

their heads than their tents, they, their women and children, will brave all the rigour of winter. The favourite wife or child enjoy whatever luxury of dress belongs to the tribe, consisting of gold bracelets, necklaces, silver and gold ornaments for the hair; frequently a handkerchief is edged with perforated silver coin, and bandeaus of the same are tied about the head and neck. It is not uncommon to meet with ancient medals suspended about the neck and heads of the I'liyát women and children.

The time of the I'liyát's rest is the winter, when his flocks are not productive, and require no other care than being led to pasture. The men then help the women to weave carpets and tent cloths, or spin goats' hair. At the appaoach of spring all is then full of activity; the ewes bring forth, then the lambs are tended; then shearing comes on, the flocks require constant milking, and the numerous uses to which the milk is consigned, that is, butter, dough, and raughan, require much work, which the men perform. The women, too, are very laborious: they pitch and unpitch their encampments when on a march, load and unload the beasts of burthen, attend the children and the young animals: they sit down in companies to spin, and help to churn and make sour milk. The drudgery is for the women, the business of protection, purchase and sale, and all the greater interests of the community, for the males.

The I'liyáts break up their winter encampments one month after the festival of the Nau-Rúz—*i. e.* one month after the sun has entered the sign Aries, and travel by easy journeys, of two to three miles each day, to what they call the *Ser-hadd,* or the boundary between the cold and hot region: there they stay for about a month and then travel on again to their Yaïlák, where they encamp during the heats of summer, and where they remain about seventy days; they then return to the Ser-hadd, where they remain another month, and at length reach their old haunts in the Kishlák for the winter. Many direct their motions by the rising of the stars, and many by the appearance of the snowy mountains. They are unmolested in their passage, and perhaps may give a sheep or so to the lords of the villages near which they travel. The ground upon which they encamp is improved by their presence, since it is strengthened by the manure they leave.

Their mode of calculating property is by sheep: they pay their shepherds in sheep. In their own dealings, in their purchase of oxen, &c., they pay in sheep. A man killing one of their dogs is liable to be fined four sheep. Among the villages, too, in their smaller dealings, the Persian Rayah deals with his neighbour, not in money, but in kind, corn, wool, straw, &c. Three months after the Nau-Rúz they separate the rams from the ewes, and feed

them till they are *mest.** At the beginning of the sign *Mízán,* or Libra, they turn them into the flock, by which the ewes bear at about the Nau-Rúz, and some of the I'liyáts celebrate this event by music, songs, and merry-making. Shearing takes place twice in the year; the first time after the Nau-Rúz, about the 20th of May, and the second at the Mízán. They give of their wool and other produce of their flocks, which is called by the general name of Kashf,† to the poor in alms. At the time of the new lambs they take portions of their milk, which they make into curds, cream, kaïmák,‡ and fresh cheese, and send it to their friends as a complimentary gift, marking the return of the season. A shepherd has the care of three hundred sheep, and is paid in kind, both in wool and lambs.

From what has been said, it is evident that the I'liyáts, as raw materials for the formation of troops, must be of considerable consequence to the state of which they are the subjects. They are soldiers by nature, as far as the mere habit of the man goes, but it must be added, they are difficult of discipline, owing to their clan-like propensities. Those on the frontier frequently give rise to feuds and war. One of the principal objects of the war carried on by the Persians against Russia was to induce the I'liyáts of Karábágh, Shekí, &c., to return to their allegiance to the Sháh. On the frontiers both of Turkey and Russia the same scenes of clandestine migration take place as those described by Herodotus of the Scythian nomades. Cyaxares seemed to be as well aware of their worth as 'Abbás Mírzá was, for he received those who fled with great kindness and showed them much favour. One of the great sources of bickering between the Turks and Persians are the Kurds on their frontier, who migrate from the one state to the other, as best suits their humour or interests. Good legislation would no doubt soon turn them into peaceable and industrious communities; but as the eastern governments are at present constituted, the vast regions inhabited by these wanderers must continue mere tracts of waste, adapted solely to the uses of armed shepherds and lawless freebooters.

* Literally "intoxicated."—F. S. † "The opening," *i.e.* first-fruits.—F. S.
‡ Clouted cream.—F. S.

XX.—*Vocabulary of Names of Places, &c. in Moghribu-l-Akṣá, or the Empire of Marocco;* By the Chevalier Count GRÅBERG af Hemsö, Hon. Mem. R.A.S., & R.G.S. Par. and Lond., &c.

THE inconvenience occasioned by the discordance in our maps of Marocco with respect to the names of the same place, and the difficulty, in some instances, of ascertaining what is the name given to a place by the natives, led the compiler of the following Vocabulary to collect from Arab writers and intelligent Moghrebines as complete a list as could be obtained of all the provinces, cities, rivers, mountains, and tribes, included in that Empire These are given both in the Arabic and Roman character, with their respective longitudes and latitudes, wherever they could be obtained, and occasionally short notes, giving the meaning of the name, or some collateral notice respecting the place.

As great confusion has arisen from the ambiguity of the English orthography, our older Orientalists in the seventeenth century usually imitated the Italians, whose system of spelling is the most simple and invariable of any generally known to Europeans. Sir William Jones, on the formation of the Asiatic Society, improved on this method by reducing it to still greater clearness and precision. The principles on which it rests, and the inconvenience occasioned by the want of such a standard, are ably stated in his 'Dissertation on the Orthography of Asiatic Words in Roman Letters,' at the commencement of the Asiatic Researches. That system, with some small modification, has been here followed; and as the subjoined alphabet will make the reader immediately acquainted with the application of it to the Arabic character, it will be sufficient here to add, that its fundamental principle is, to give invariably the same symbol for each letter in the original, so that any word may be at once transferred without danger of error, to its proper character. The foreign words, morever, will be correctly pronounced if the reader will take the trouble to recollect, that the vowels have

the sound given to them in the Italian, the consonants that which they have in the English language. The long vowels, and consequently emphatic syllables, are distinguished by an accent. The diphthong by a diæresis.

The greater part of this Vocabulary was compiled at Tangier, and the learned and intelligent natives to whom the compiler was chiefly indebted were:

1. The *Tálib* (student) *Sídí Mohammed ben Idrís, el Waraïní, el Himyarí*, native secretary to the Swedish Consulate at Tangier.

2. *El Hájj* (the pilgrim) *Sídí 'Abdu-l-kerím ben Tálib*, of Tetuan, a great traveller, who had resided sixteen years at Lisbon, and could speak several languages fluently.

3. *El Fakíh* (the doctor) *Sídí-l-'Arabi ben Dúnás, el Wertíghí*, of Dubdú, in the province of Kúzt, who had been fifteen years an *'adúl* or clerk in a court of law. He was a Berber.

4. *Sídí-l-Hájj 'Alí ben al kúdí 'Abdu-l-kerím, es-Súsí, el Enfífí*, a Shelúh, who, though illiterate, was a very trustworthy person, and long in the compiler's service.

5. *Mohammed ben Mas'úd et-Temsenání*, a Berber from Er-Ríf, of the tribe of Wariyághel, gardener to the Swedish Consulate at Tangier.

6. Father *Pedro Martin del Rosario*, a Franciscan, Chaplain to the Spanish Consulate at that place, well acquainted with both Arabic and Amazígh.

7. *El Káyid* (the Captain) *Ahmed ben Suleïmán*, an Italian renegado, originally named *Antonio Piloti*, master of the ordnance to *Múláï Suleïmán*, a very intelligent and well-informed man.

8. Signor *Antonio Benedetto Casaccia*, Swedish, French, and Sardinian Vice-consul at Mogodór, who had resided in Barbary for twenty years, and could speak the languages of the country very fluently.

9. Mr. *Isaac Aben Sur*, a Jew, Interpreter to the British Consulate at Tangier.

10. *Ya'kúb ben Sellum*, also a Jew, a native of Tangier, and interpreter to the Swedish and Sardinian Consulate there.

11. *M. Jean Baptiste Geoffroy,* Dragoman to the French Consulate at Tangier.

The Arabic works consulted were:

1. The well-known history entitled *El-ḳárṭás.*
2. *Noz-haṭu-l-hádí bi-Akhbári mulúk el-gharb ḳarni-l-ḥádi*
3. *Kitábu-l-'ibar wa Akhbári-l-Berber* of *Ibnu Khaldún.*
4. *Kitábu-l-mu'ajjib fi akhbári-l-Maghrib,* of the *Sheïkh 'Âbd-allah el Merákishí.*
5. *El-Moghrib fí akhbári-ehli-l-Maghribi,* of *'I'sa Ben Hasem el Andalúsí,* and other historical and geographical MSS. works.

But it must be remembered, that the Moors are in general very inattentive to orthography, and that the Berbers, who seldom express their own language in writing, have little or no idea of spelling their words according to any fixed rule or principle.

[In the column of authorities, A. signifies Arlett, B. Badia, Bér. Bérard, W. Washington; they are only given where actual observations were made; for many of the positions of the interior we are indebted to M. D'Avezac's Sketch of a Map of Northern Africa; many others must be considered only as an approximation to the truth, and are merely given to the nearest quarter of a degree, to enable the reader to find them in the Map.]

The Arabic Alphabet.

ب *Elif,* *a,* أ *a,e,* إ *i,* أُ *u,o,* بَا *bá,* بِي *bí,* بُو *bú* or *bó,* بَيْ *beï* or *baï,* بَوْ *bau* or *beu.*

ب *Bá,* *b.*

ت *Tá,* *t,*

ث *Thá,* *th,* as in through, thing, *t* or *ts,* by the Moors; *s* by the Turks and Persians.

ج *Jím,* *j,* as in judge.

چ *Chím,* *ch,* as in cheer. This occurs in Berber, not in Arabic words.

ح *Há,* *ḥ,* a very strong aspiration.

خ *Khá,* *kh,* the Scotch, Welsh, Irish, or German *ch.*

د *Dál,* *d.*

ذ *Dhál*, *dh*, i. e. *th* in thou, they; ẓ in Persian and Turkish.
ر *Rá*, *r*, commonly *d* by the Moors, Egyptians, and Syrians.
ز *Zá*, *z*.
ط *Tá*, *ṭ*, like double *t*, a strong dental.
ظ *Ẓá*, ẓ, *ḍz*, or *ḍ*.
ك *Káf*, *k*.
ݣ *Gáf*, *g*, as in good, glad. The three points are placed above, in Persian. In Turkish *ñ*, i. e. *ng* or *ny*; the Italian *gn*.
ل *Lám*, *l*.
م *Mím*, *m*.
ن *Nún*, *n*.
ص *Ṣád*, *ṣ*, a sharp sibilant like double *s*.
ض *Ḍád*, *ḍ*, like double *d*.
ع *'Aïn*, *'a*, *'i*, *'u*, a sort of catch; deep in the throat,
عين *'aïn*, علم *'ilm*, علما *'ulemá*.
سعد *sa'd*, فعل *fi'l*, معلم *mu'allem*.
غ *Ghaïn*, *gh*, the *r* of the Northumbrians, often by the Moors like a guttural *r*.
ف *Fá*, *f*, the Moors place the point beneath.
ق *Ḳáf*, *ḳ*, a deeper guttural than *k*, commonly sounded as *g* by the Western Arabs.
س *Sín*, *s*.
ش *Shín*, *sh*.
ه *Há*, a slight aspiration. ة final is pronounced as *ṭ*.
و *Wáw*, *w*, او *ú*; = *oo* in moon.
او *au*; = *ow* in cow, how.
ي *Yá*, *y*, اي *í*; = *ee* in sweet.
اي *aï*; = *i* in high, sigh.
eï; = *ey* in they, *ay* in day.
ݣ *zha*, *zh*; *s*, as in measure, by the Berbers and Sheluḥs; the French *j*.
ء *Ḥamzah*, an abbreviation of *Elif*, for which it is often substituted.

	A.		Lat.N. ° ′	Long.W. ° ′	Authority.*	*Etymologies and Remarks.*
عبدة	*'Abdah,*	province.	32.30	8.30		The name of a province is usually that of the chief tribe.
عبدون	*'Abdún,*	village.	35.15	3.15		The servants.
عبد النبي	*'Abdu-n-nĕbí,*	tomb.	33.20	8.10		The prophet's servant. *Ar.* A Kobbeh, *i. e.* a saint's tomb.
ابو عناني	*Abú 'Anání,*	village.				Or Bu'Anani.
— عزار	*— 'Azár,*	village.	35.15	3.30		A place where asses are loaded.
— فكرون	*— Fekrún,*	river.				Father-tortoise. The river Bat.
— حرايه	*— Ḥaráyah,*	well.	29.40	3. 0		Place where the ostriches deposit their eggs.
— حفرة	*— Ḥofrah,*	well.	33.10	7. 8	W.	Father-pit.
— عنان	*— 'Inán,*	village.	31.30	1.30		On the Wad Ghir.
— ناصر	*— Náṣir,*	tomb.	33.30	5.30		The protector or defender.
— رقراق	*— Raḳráḳ,*	riv. & tr.	34. 3	6.50		Father-ripple, vulgo Bú Regreg.
— سلم	*— Sellum,*	tomb.	34.53	6.21	A.	Father-ladder.
ادحسن	*Adaḥsun,*	plains.	32.30	6. 0		Plenty of corn.
ادن	*Aden,*	mountain.	32.30	4.30		The mountains are usually named after the tribes which inhabit them.
ادندوم	*Adendúm,*	village.				
ادرار	*Adrúr,*	mount.				Mountains. *Ber.* The range of the Atlas is so called.
افرة	*Afrah,*	station.	28. 0	6. 0		On the limit of the desert.
افزارة	*Afzúrah,*	river.				Sandy, or running in the sand. *Ar.* & *Ber.*
عگدير	*'Agadír,*	town & port.	30.27	9.36	A.	A wall. *Ber.* Santa Cruz of Europeans, the best port on the Atlantic coast.
اكرسيف	*Agarsíf,*	village.	34.50	2.20		On the western bank of the river Muluyah.
اغلا	*'Aghlá,*	villages.	34.30	5.30		A high green market-place. *Ar.*
اغمات وريكه	*Aghmát Waríkah,*	town.	31.20	7.35		Probably the ancient *Bocanum Hemerum?*
— ايلان	*— Aïlan,*	ruins.				Or I'lán.
عكولو	*'Agúlú,*	cape & vil.	29.49	9.48		Country covered with herbs or plants.
ايدو اكال	*Aïdú-Agal,*	mount.	30.40	9. 0		The great mountain. *Ber.* Western Atlas.
عين البردة	*'Aïn-el-berdat,*	defile.	30.45	8.30		The cold spring. *Ar.*
— الفلفل	*— -el-felfel,*	spring.	34.45	6.21	W.	The pepper spring.
— حلو	*— ḥalú,*	spring.				The sweet spring. *Ar.*
— توكه	*— túgah,*	distr.	31. 0	8.30		*Túgah* grass. *B.* Grass spring.
— الداليه	*— -ud-dáliah,*	spring & vil.	35.38	5.50	W.	Vineyard spring.

Note.—The káf ought to have three points under it, but these marks for distinguishing *k*, *g*, and *ń* or *n* (*ng* or *ny*) are seldom used in Berber, Persian, and Turkish.—F. S.

			Lat.N. ° ′	Long.W. ° ′	Authority.	*Etymologies and Remarks.*
عين ياله	*'Aïn Yálah,*	spring & vil.	31. 0	2.30		
عيث اكريث	*'Aïth Agaríth,*	tribe.				*'Aith* answers in Berber to *Beni* or *Aulad* in Arabic, and signifies children, sons, or tribe. It is often pronounced *'Aits* in Marocco. A few only of the chief tribes are here given.
— بامران	*— Bámarán,*	id.				
— اموري	*— Emúri,*	id.				
— غراري	*— Gherárí,*	id.				
— كروان	*— Girwán,*	id.	33.30	3.30		
— اسحاق	*— Is-ḥáḳ,*	id.				Tribe of Isaac.
— كتيوه	*— Kittíwah,*	id.				
— موسي	*— Músa,*	id.				
— اولوت	*— O'lót,*	id.				
— عثمان	*— 'Othmán,*	id.				
— صدوغ	*— Ṣadúgh,*	id.				
— شكروشي	*— Shagrúshí,*	id.				
— شديده	*— Shedídah,*	id.				
— ثموري	*— Themúrí,*	id.				
— ثيلطان	*— Thílṭán,*	id.				
— يعقوب	*— Yaḳúb,*	id.				Tribe of Jacob.
— يعقوث	*— Ya'ḳúth,*	id.				
— يزدق	*— Yezdaḳ,*	id.				
— يوصي	*— Yúṣí,*	id.	33.15	4.30		
— زانه	*— Zánah,*	id.				
— زينب	*— Zeinéb,*	id.	31. 0	6.20		
اقبلي	*Aḳablí,*	station.	27. 0	1. 0	E.	Corruption of Kibli, i.e. SE.
اكصه	*Akaṣah,*	river.	28.15	10. 0		Assaka? Wad Nún? Possibly Azkai or Azoucai of Edrisi?
اكه	*Akkah,*	station.	28.30	8. 0		On the borders of Sahra.
اكرموت	*Akkermút,*	plain.	31.45	9.30		
اكلاو	*Aklau,*	hill.	35.30	5.50	W.	Well-wooded hills, about 600 feet high.
اقصابي الشرفا	*Aḳsábeï-sh-shurefa,*	castle	33. 0	3.40		The Castles of the Sherifs. *Ar.*
العلم	*Al-'Alem,*	mount.	30.15	8. 0		The landmark or standard.
العرايش	*Al-'Aráïsh,*	town.	35.13	6. 9	W.	The trellices. A walled town and port on the Atlantic. Pop. 4,000.

			Lat. ° '	Long.W. ° '	Authority	Etymologies and Remarks
الاموص	*Alámós,*	village.	35.20	5. 0		On the coast of the Mediterranean. Alames. *Sp.*
العريب	*Al-'Aríb,*	tribe.	28. 0	4.20		Kafilah station on the limits of the desert.
الاودية	*Al-Aúdiyah,*	tribe.	28. 0	11. 0		Vallies or streams.
الاوتاد	*Al-Autád,*	remains.	35.25	5.45		The tent-pins; blocks of stone erected round the foot of a small circular hill.
البران	*Al-borán,*	island.	35.58	3. 2		
القصبة	*Al-ḳaṣbah,*	castle.	34.10	2.50		A town, a citadel; this is a common name in Marocco, the position of that on the Wad Muluyah is given.
القصر كبير	*Al-ḳaṣr kebír,*	town.	34.57	5.52	W.	The great castle. Walled town with 8000 inhabitants.
القصر صغير	*Al-ḳaṣr ṣaghír,*	village.	35.40	5.35		The little castle of the Berber tribe of Masmudah on the Mediterranean.
الخزامه	*Al-khozámah,*	vil. & bay.	35.14	3.48		Village at the mouth of the Wad Nakkor.
المينه	*Al-mínah,*	hill & town.	35.53	5.20		The port. *Ar.* The hill of the port of Sebtah or Ceuta.
المدراوه	*Al-mudráwah,*	village.	35.36	6. 0		Noted for its tunny fishery, Almadrones of our maps.
امزيغ	*Amazígh,*	people.				The 'great.' The name by which the Berbers distinguish themselves.
انجاد	*Angád, or Anjád,*	desert.	34.30	2. 0		On the confines of Marocco and Algiers.
انفا	*Anfá,*	town.	33.36	7.40		Dár el beidá, the ancient Anafe, a walled town of 700 inhabitants.
انينه	*Anínah,*	hill.	31.30	7.15	W.	A range of limestone hills, S.E. of the city of Marocco, 500 feet above the level of the plain.
انجره	*Anjerah,*	tr. & dist.	35.30	5.40		
ارضاط	*Arḍáṭ,*	river.	34.25	5.30		
ارشقول	*Areshḳúl,*	village.	35.20	1.30	Bér.	A bay and island in the Mediterranean.
ارقان	*Arḳán,*	tribe.				Arkán is the Ar. and Berb. name of the Elæodendron Argan (*i. e.* Arkan).
اسافي	*Asáfí,*	town.	32.17	9.13	A.	Vulg. Saffi. A walled town on the Atlantic, pop. 9000
اسيف	*Asíf,*	river.				River. *Ber.*
اسيفك	*Asífek,*	id.				Yonder river. *Ber.*
اسيف انوال	*Asíf Inwál,*	river.	31.50	8.15		The river Inwal. *B.* A tributary to the Wad Tensift.
اصيلا	*Aṣílá,*	town.	35.28	6. 2	A.	Asílá signifies 'good.' (Bekri in Not. et Extr. xii. 570.)
اسه	*Assah,*	river.	29.50	9.50		Or Tesset, fem. of Assah in *Ber.*
اوكستم	*Augustom,*	mount.	34.30	4. 0		
اولاد عبد الكريم	*Auládʼ Abd-el-kerím,*	tribe	33.15	3.15		*Aulad,* Sons or children. *Ar.*
— ابو عزيز	— *Abú 'Azíz,*	id.	32.45	8.30		*'Azíz* means exalted, and metaphorically, excellent.
— ابو سباع	— *Abu Sebá',*	id.	30. 0	10. 0		Father-lion.
— الفراش	— *Al-Ferrásh,*	id.	32.45	8.30		The spreader, or thing spread, a carpet.

			Lat.N. ° ′	Long W. ° ′	Autho-rity.	Etymologies and Remarks.
اولاد عمر	*Aulád 'Amar,*	tribe.	30. 0	8. 0		
— بني عمر	— *Bení 'Amer,*	id.				
— بوريس	— *Bú-rís,*	id.	30. 0	9. 0		Father-feathers, *i.e.* snow.
— دليم	— *Duleïm.*	id.	29. 0	8. 0		Sycamore.
— دويب	— *Duweïb,*	id.	33.10	8.30		Sons of the besiegers, *viz.* of Mazi'gan.
— فراجي	— *Farájí,*	id.				
— حمرون	— *Hamrún,*	id.	29.30	8. 0		
— حدجه	— *Hedejah,*	id.	34.30	1.30		
— حسين	— *Hoseïn,*	id.	33. 0	6. 0		Remains of an ancient Arab tribe.
— عيسي	— *'I'sa,*	id.	34.30	5.15		Children of *I'sa* or Jesus.
— جرعه	— *Jar'ah,*	id.	28.30	9. 0		
— منابه	— *Menábah,*	id.				
— منصور	— *Mansúr,*	id.	34. 0	1.45		
— محمل	— *Mohammed,*	id.				
— متاعه	— *Motá'ah,*	id.	34. 0	4.15		
— متفق	— *Mottafik,*	id.	34.30	6.15		
— رهامنه	— *Riháminah,*	id.	31.15	8. 0		Tribe and province.
— سليم	— *Selím,*	id.	30.30	6. 0		
— طلحه	— *Talhah,*	id.	34.30	2. 0		The children of the gum tree (acacia gummifera).
— زيد	— *Zeïd,*	id.				Powerful Arab tribe.
— زهير	— *Zohaïr,*	id.				Idem.
عيون الاصنام	*'Ayún-el-esnám,*	spring.	33.30	4.45		Idol-springs.
عيون ملوك	*'Ayún Mulúk,*	fountains.	34.30	2.20		The sources of the Kings.
عيانه	*'Ayyánah,*	mount. & dis.	33. 0	5. 0		Country of springs. *Ar.*
عياشه	*'Ayyáshah,*	river.	35.32	6. 3	W.	Reviving.
ازمور	*Azamór,*	town.	33.18	8.15	A.	Olive, *Ber.* A walled town, population about 3,000.
ازكاري	*Azgárí,*	plains.	33.30	4.30		A pasture ground for cattle. In *Ber.* Azgár or Ezgár means a bull.
ازكن	*Azgun,*	mount.	33.30	4.20		A plain road.
ازقار	*Azkár,*	distr.	34.30	6. 0		*Azgar*, says Marmol, signifies a country abandoned by the sea. It is the name of a Berber tribe.
عزله	*'Azlah.*	salt river.				
ازواكه	*Azwágah,*	tribe.				Or Zuwayah.

B.

			Lat.N. ° ′	Long.W. ° ′	Autho-rity.	*Etymologies and Remarks*
بابا	*Bábá,*	promont.	35.15	4.10		Father.
بادس	*Bádis,*	town.	35.12	4.14		Velez de la Gomera (Sp.) from the name of the tribe.
بحرين	*Baḥreïn,*	mount.				The two seas.
بحرالظلمه	*Baḥru-d-dolmat,*	Atlantic.				The sea of darkness.
بحرالكبر	*Baḥru-l-kabír,*	id.				The great sea.
بحرالرومي	*Baḥru-r-Rúmí,*	Mediter.				The Roman, or Christian, sea.
بحرالصغير	*Baḥru-ṣ-ṣaghír,*	id.				The lesser sea.
بحرالزقاق	*Baḥru-z-zaḳáḳ,*	strait.				The eastern end of the straits of Gibraltar.
بريجه	*Baríjah,*	town.	33.16	8.31	A.	Or Mazi'ghan, formerly Borelhhah.
بصره	*Baṣrah,*	village.				The ancient *Banasa.*
باط	*Báṭ,*	river.	34.15	6.30		Something large that dwindles into nothing.
بيره	*Beïrah,*	plains.	32. 0	7.45		A plain with wells.
بلوط	*Beïlúṭ,*	forest.	34.15	6.30		Acorn, or oak. Ar. (Quercus Ballota.)
بليونس	*Belyónes,*	village.				Father of Jonas (?)
بني ابو ثيبت	*Bení Abú Theïbet,*	tribe.				*Beni,* sons or children, *Ar.*
— ابو تويه	— *Abú Tóyyah,*	id.				
— احراش	— *Aḥrásh,*	id.				
— علي	— *'Alí,*	id.	31.30	6.15		The sons of 'Alí.
— الكوي	— *Alkowí,*	id.				
— عمير	— *'Amír,*	id.				
— عمر	— *'Ammer,*	tr.& mount.	33.30	1. 0		The mountains generally take the names of the tribes inhabiting them.
— عروس	— *'Arós,*	tribe	35. 0	5.30		
— بهلول	— *Bahlúl,*	village.	33.30	5. 0		Bahálíl, plural.
— بسيل	— *Basíl,*	tribe& vil.				
— بصاري	— *Beṣárí,*	tribe& vil.	32.30	3. 0		
— بو سعود	— *Bú Sa'úd,*	tribe.				
— كرير	— *Garír,*	tr.& mount.				The sons of the unskilful.
— كواموده	— *Găwámúdah,*	tribe.				Or *Guwamudah.*
— كورنيد	— *Găwernid,*	id.				Or *Guwernid.*
— كباره	— *Gebárah,*	id.				

Arabic	Name	Type	Lat.N. ° ′	Long.W. ° ′	Authority.	*Etymologies and Remarks.*
بني كبير	*Bení Geber,*	tribe.				
— حليت	— *Ḥalít,*	id.				
— حامد	— *Hámed,*	id.				Or Ahmed.
— حامر	— *Ḥámer,*	village.				Probably Ahmar thus pronounced.
— حسن	— *Ḥasan,*	tr.&mount.	34. 0	6. 0		
— هاشم	— *Háshim,*	tribe.				
— يسفتن	— *Yasfaten,*	tr.&mount.	34. 0	3.30		
— ياسكن	— *Yásgan,*	tr.&mount.				
— ابراهيم	— *Ibráhím,*	tribe.				Children of Abraham.
— افران	— *Ifrán,*	id.				يفرون or *Yafrun.*
— اسملانه	— *Ismelánah,*	id.				
— اثنوث	— *Ithnúth,*	id.				
— منصور	— *Manṣúr,*	id.				
— مرنيسه	— *Marnísah,*	id.				
— مسيل	— *Masíl,*	id.				
— مزوبه	— *Mazúbah,*	id.				
— مغر	— *Megher,*	id.				
— ملك	— *Melk,*	id.				
— مراسن	— *Merásen,*	tr.&plains.				
— مسكين	— *Meskín,*	tr. & dist.	32.45	6.45	W.	Children of the poor.
— ماجلده	— *Methjildah,*	tribe.				
— عبيد	— *'Obeid,*	tr.&mount.				A very ancient Arab tribe.
— عمر	— *'Omar,*	tribe.				
— رازين	— *Rázín,*	id.				
— سبيح	— *Ṣabíḥ,*	id.				
— سهيد	— *Sahíd,*	id.	34.45	3.30		
— سعيد	— *Sa'íd,*	id.	34.45	3. 0		
— طماره	— *Ṭamárah,*	id.				Abounding in dates.
— تعمير	— *Ta'mír,*	id.				
— تفرن	— *Tefren,*	id.				

			Lat.N. ° ′	Long.W. ° ′	[illegible]	*Etymologies and Remarks.*
بني تليته	*Beni Telítah,*	tribe.				
— تنزيران	— *Tenzírán,*	id.				
— تودة	— *Teudeh,*	tr. & vil.				The ancient *Babba.*
— توزين	— *Teuzín,*	tr. & vil.	34.45	3.30		
— ورياكل	— *Wariyágal,*	tr. & vil.	35.15	5.30		Or Viryágal.
— واد فلاح	— *Wád Felláḥ,*	tribe.				*Fellah,* a husbandman in Egypt, but here a seaman who ploughs the sea.
— وليد	— *Welíd,*	tr. & vil.				
— ورتناجي	— *Wertenájí,*	tribe.	34. 0	3.30		
— ورثيغه	— *Werthíghah,*	id.	33.40	3.30		
— يافوس	— *Yáfús,*	id.				
— زنتن	— *Zanten,*	id.				
— زكر	— *Zekker,*	tribe.	34.45	4.45		
— زروال	— *Zerwál,*	tr.&mount.	35. 0	5.15		
— زيان	— *Zeyyán,*	tribe.				
— زيمات	— *Zímát,*	id.				
برانس	*Beránis,*	people.	34.30	4. 0		Plural of Burnús (a cloak). One of the two great primitive branches of the Amazighs, descending from *Bernas.*
بيباوان	*Bíbáwán,*	mount.&pass.	31. 0	8.40		Beans. *Tam.* The two gates or defiles. *Ar.*
بلاد الشرفا	*Bilád-esh-Shurefá,*	count.	30.30	3. 0		The country of the Sherifs or nobles.
بلاد السكر	*Bilád-es-sukkar,*	district.				The sugar country.
بلاد كبيرة	*Bilád Kebírah,*	city.	31.38	7.36	B.	The great city, Marocco.
بلاد سيد هشام	*Bilád Sídí Hishám,*	id.	29. 0	9.30		The country of the independent chief of Sús-el-Aksà.
بلاد الاحمر	*Biládu-l-aḥmar,*	district.	32.15	9. 0		The red country.
بلاد الجريد	*Biládu-l-jeríd,*	region.	31.30	2. 0		The land of the *jeríd, i. e.* the dry branches of the palm-tree, used as javelins.
بلاد المغرب	*Biládu-l-Moghrib,*	region				*Belad,* country, &c. *El Moghrib,* the west.
بوغاز	*Bógház,*	strait.				Straits of Gibraltar. A Turkish word signifying mouth or throat.
بهايم	*Boháyim,*	village.	31.	2.30		Cattle, or *Abu'Amm.*
بوقيا	*Bóḳayyá,*	id.				
بربر	*Berber,*	people.				Plural Berébér, probably derived from the Greek and Latin word *Barbaros,* adopted in Arabic.
بهموت	*Buhmút,*					A deep ditch.
بوسناكه	*Businágah,*	river.	33.50	7.10		
بوريس	*Bú-rís,*	defile.	30.45	8. 0		Father-feathers, *i. e.* snow.

	D.		Lat.N. ° ′	Long.W. ° ′	Auth.	*Etymologies and Remarks.*
دادس	*Dádes*, vulg. *Dédes*,	mount	32.45	5. 0		
ديموس	*Daïmús*,	village.				Den, or cave. *Ar.*
درعة	*Dar'ah*,	province.	30. 0	6. 0		Vulgo Draha.
دار عيت ثانه	*Dár 'Aith-thánah*,	vil.	35.15	5.55	W.	The abode of the Shelluh tribe Aith-thana.
— اكلاو	— *Akláú*,	hill.	35.35	5.50	W.	Well-wooded hills about 600 feet high.
— دليمي	— *Duleïmí*,	village.	29.30	9.30	.	The residence of the tribe of Duleïm.
— البيضا	— *el-Beïḍá*,	town.	33.37	7.35½	A.	White house. See *Anfa*.
— القريسي	— *-el-ḳurísí*,	house.	34.45	6.25	W.	Cold or bleak house.
— حمران	— *Hamrán*,	village.				
— جديدة	— *Jedídah*,	part of Fas.	34. 6	4.57	B.	New house.
— مبارك	— *Mubárak*,	hamlet.	32.40	8.30	W.	Blessed house, vulgo Embark.
— شاوي	— *Sháwí*,	village.	34. 0	2.30		House of Shawi tribe.
— ام السلطان	— *Ummu-s-Sulṭán*,	vill.				The house of the Sultan's mother.
ديرة بادس	*Deïraṯ Bádis*,	town.	35.12	4.15		Velez de la Gomera.
ديرة مليله	— *Melílah*,	town.	35.22	2.52		The abode of the tribe Melilah.
دمنسارة	*Demensárah*,	mount.	30.45	8.15		
دمنة	*Demneṯ*,	town.	31.30	7.10		Bodily wrong, disease.
درن	*Deren*,	mount.				*I. e.* Mountain. The Berber, and thence Arabic, name of Atlas.
درنة	*Dernah*,	river.	32.45	5.15		Filthy, dirty.
ذوقصال	*Dhú-ḳasál*,	vil. & port.	33. 4	8.36		Master of the sharp sword.
ذوالقمحة	*Dhú-l-ḳumḥah*,	village.	30.53	7.30		Owner of the corn.
دبدو	*Dubdú*,	town.	33.45	3.30		
دكالة	*Dukkálah*,	prov. & tr.	32.45	8.30		
دويرة	*Dweïrah*,	river.	31.15	9.45		
	E.					
افزة	*Efzah*,	town.	32.30	5.30		Sand or sand-stone. *Ber.*
عكل انكيكل	*Egel-ingígil*,	town.	31.15	8.45		*Eghel*, land, soil. *Ber.*
الالة	*Elálah*,	mount.	29.30	9.15		
امسكروت	*Emsïgurót*,	village.	30.30	9.15		
انفيفة	*Enfífah*,	tr. & riv.	31.10	7.50		A numerous and powerful tribe.

			Lat.N. ° ′	Long.W. ° ′	Authority	*Etymologies and Remarks.*
الريصاني	*Er-ríṣání,*	fortress.	31.15	2.15		Caillie's *Ressant.*
اسفي	*Esfá,*	ford.	33.30	6.30		Rapid ford.
السيس	*Es-sís,*	desert.				Weevils or moths.
		F.				
فكاسه	*Fagásah,*	town.	35.20	4.56		Broken. *Ber.* Small town on the Mediterranean.
فحص اولاد ابو عزيز	*Faḥṣ aulád abú'Azíz,*	vil.	32.55	8.25	W.	
فحص الريحان	*Fáḥṣ-ur-ríḥán,*	valley.	35.23	5.53	W.	Myrtle-valley. *Fahs. Ar.*
فاس	*Fás,*	city.	34. 6	4.58	B.	A spade or pickaxe.
فضاله	*Feḍálah,*	town.	33.44	7.23½		A walled town on the Atlantic, pop. 300. A fair roadstead. *Fedalah,* excellent, pre-eminent.
فلفله	*Felfelah,*	river.	34.30	6.30		
فليل	*Felíl;*	tribe.				The exiled, ejected, or expelled part of a people.
فرقله	*Ferḳalah,*	village.	31.45	3.30		
فيضه	*Fídah,*	town.				Plenty, abundance.
فغيغ	*Fighígh,*	station.	33. 0	2. 0		
فلالي	*Filálí,*	tr. & dist.	31. 0	2.45		Disbanded, defeated troops. Vulgo Fileli.
فشتله	*Fishtalah,*	tribe.	32.30	5.30		
فروغه	*Frúghah,*	m.& dist.	31.15	8. 0		Emptied, grooved.
		G.				
كرط	*Garṭ,*	riv.&prov.	34.45	3. 0		
كرندو	*Gerandó,*	tower.	32.20	8.12	W.	A beacon or watch-tower on the top of a hill about 500 feet above the plain.
كراره	*Gerárah,*	tr. & cast.				
غابه ذا البلوط	*Ghábah dhá-l-Belúṭ,*	forest.	34.15	6.30		Forest of oaks. Forest of Mamorah.
غربيه	*Gharbíyah,*	tr. & reg.				Western.
غرغايه	*Ghargháyah,*	mount.	31.30	3.30		
غريب	*Gharíb,*	tribe.	29.30	5.15		A stranger, foreigner. *Ar.*
غرير	*Gharír,*	tribe.	34.50	4.30		Inexperienced, unskilful people. Beni Gharir.
غواتة	*Ghawátáh,*	mount.	33.55	5.20		Above Miknas.
غار	*Ghár,*	fortress.	33.15	5.15		*Ghar, B.* between, *i. e.* between two rivers; the ancient *Cillaba.*
غريس	*Gheriṣ,*	village.	31.30	3.15		Plantation.

			Lat.N. ° ′	Long.W. ° ′	Authority.	Etymologies and Remarks.
غرس علوين	*Ghers-'alúin,*	village.	32.27	3.30		Corruptly for Kasr el Alewin.
غير	*Ghir,*	river.				In the desert.
غبار	*Ghobár,*	river.	33.45	7.15		Dust, the dusty river.
غمارة	*Ghomárah,*	town & tr.	35. 0	4. 0		One of the original Berber tribes, the ancient town Parletina.
غورتكيسم	*Ghúrtgessem,*	town.	30.26	9.36		The town and port Agadir.
غوط صدامه	*Ghúṭ Ṣedámah,*	town.	31.20	7.40		Or *Guzdama*, the low valley of adversity.
كغلان	*Gughlán,*	village.	31. 0	2.30		Caillie's Gourland.
كريكورة	*Gureïgúrah,*	plains.	33.30	4.15		
غوط صنهاجه	*Ghúṭ-Ṣanhájah,*	hamlet.	29.45	3. 0		Lurking-places of the Sanhajahs, Caillie's Gud-Zenaga.
الغرب	*El Gharb,*	province.	35. 0	6. 0		West. Contains Azkar and Habat.

H.

هبد	*Habad,*	village.	34.12	5. 0		Or *Hubbed.*
هبط	*Habaṭ,*	district.	35.15	5.30		Or Hasbat, the northern part of El-Gharb.
حبيبه	*Ḥabíbah,*	islands.	35.44	1. 8	Bér.	Islands on the north coast near Cape Falcon.
حداجه	*Ḥadájah,*	town.	34.23	2.48		The ford.
حادث	*Ḥádith,*	river.				New, young, or first seen.
حافة البيضا	*Ḥáfaṭu-l-beïdá,*	cliff.	35.21	6. 8		The white cliff, or precipice, on the Atlantic, 308 feet above the sea.
حاحا	*Ḥáḥá,*	tr. & prov.	31. 0	9.30		
حجر النكور	*Ḥajaru-n-nekkór,*	village.	35.15	3.48		The stone or cliff of the Nekkor. Al-hucemas.
حالف وغس	*Ḥálif wa ghuss,*	riv. & ford.				Swear and pass on.
هالن	*Hálin*	plain.				Overgrown with grass.
حلوان	*Ḥulwán,*	village.				Sweetmeat. Sweet and pleasant.
هماز	*Hammáz,*	river.				Defamer.
حمران	*Ḥamrán,*	plain.	29.45	8. 0		The two red asses.
حريلي	*Ḥarílí,*	riv. & dist.				
حارث	*Ḥárith,*	district.				Plougher.
حرشا	*Ḥarshá,*	cape.	35.46	0.48		Carved or graven. Cape Falcon.
هسكورة	*Haskúrah,*	tr. & prov.	31.45	6. 0		A very extensive tribe, even in Sus-ul-Adna.
هوارة	*Hawwárah,*	tr. & vil.	30.18	9.30		A primitive Berber tribe.
هناطه	*Henátah.*	tribe.				

			Lat.N. ° ′	Long.W. ° ′	Authority.	Etymologies and Remarks.
هنطاره	*Henṭárah,*	tribe.				
هنتاته	*Hentátah,*	mount.	31.45	6.30		
هنزوته	*Henzútah,*	tribe.				
حسن	*Ḥessen,*	mount.	35.35	5.40	A.	2,167 feet above the sea.
هلاله	*Hilúlah,*	tribe.	29.15	9.10		
هياينا	*Hiyáïná,*	province.	34.30	4.30		Declivity or slope of the mountains.
هنين	*Honaïn,*	tr. & port.	35.19	1.45		The ancient *Siga*, near Cape *Metagonium* or Cape Hone.
هرعة	*Hor'ah,*	tribe.				An ancient tribe, famous in history,
حسيني	*Ḥoseïní,*	tribe.	33.15	5.30		The descendants of Husain.

I.

			Lat.N.	Long.W.	Authority.	Etymologies and Remarks.
ايدولتيط	*I'daùltíṭ,*	village.	29.15	8.45		Mines, gold and silver. The initial syllable *Id* seems to imply the presence of water. Can it be a corruption of *aid*, great?
ايدوثكريط	*I'dauthkeṛíṭ,*	tribe.	29. 0	9. 0		
ايدوكنسوس	*I'deukensús,*	id.	29.45	8.30		
ايدونداايث	*Í deunadáyith,*	id.	29.15	3.40		
ايدوثلث	*I'deuthelth,*	id.	29.30	9. 0		
ايديوثان	*I'diyúthán,*	id.	28.45	8.30		
ايدودزدود	*I'dúdizdúd,*	id.	28.45	9.30		
ايفران	*I'frán* or *Ifrén,*	tr. & vil.	29. 0	9.45		Branch or fragment of the great tribe *Yafrum*.
اقلي	*Iḳli,*	village.	29.30	8.30		
ايليغ	*I'lígh,*	id.	29.15	10. 0		Several villages in Sus-el-aksa.
ايميمزميزي	*I'mízmízí,*	id.	30.45	8. 0		*Imi, Ber.* mouth or door; and *thmisi* fire, probably the crater of a volcano.
اسداكيس	*I'sadágas,*					
ايساوه	*I'sáwah,*	river.	32. 5	9. 2		Tributary to the Tensift.
ايسر	*I'ser,*	river.	35.12	1.15		Tributary to the Tafnah.
أيسل	*I'sil,*	river.	31.40	7.30	W.	Tributary to the Tensift.
ايتاته	*I'tátah,*	mount.	33.45	5.30		

J.

			Lat.N.	Long.W.	Authority.	Etymologies and Remarks.
جامع المقراع	*Jáma'-el-maḳrá',*	hamlet.	35.45	5.49		Mosque of the hammer for breaking stones. Mineral spring near Tangier.
جمحه	*Jamḥah,*	villages.	33.50	5.25		A name applied to several places in Marocco.
جبال عيانه	*Jebál' Ayyánah,*	mount.	32.45	5. 0		The excellent mountains.

Arabic	Name	Type	Lat.N. ° ′	Long.W. ° ′	Authority.	Etymologies and Remarks.
جبال الثلج	*Jebálu-th-thelj,*	mount.				The snowy mountains.
جبل حبيب	*Jebel Habíb,*	id.	35.27	5.45	W.	The beloved mountain, 3,174 feet high.
— حديد	— *Hadíd,*	id.	31.44	9.26	A.	The iron mountains, 2,308 feet above the sea.
— كبير	— *Kabír,*	hill.	35.45	5.50		The great hill just to the west of Tangier.
— خضر	— *Khadr,*	mount.	32.30	7.30	W.	The green mountain.
— موسي	— *Músa,*	id.	35.45	5.30		The mountain of Musa, near Ceuta.
— صرصر	— *Sarsar,*	id.	34.46	5.36	W.	Conical hill, rising about 800 feet above the plain. Cricket mount.
— ثاتوث	— *Thátúth,*	id.	35.50	5.25		The ape's hill or mountain.
جبلين	*Jebeleïn,*	mount.				The two mountains.
جبهه	*Jebhah,*	village.	35.15	4.15		The front or forehead; village on the North coast near Point Baba.
جبلات	*Jibbillát,*	hills.	31.45	7.30	W.	A range of schistose hills rising about 500 feet above the plain of Marocco.
جيغو	*Jíghú,*	vil. & riv.	33.45	4.30		Or *Gigu*, and sometimes Gwigo.
جزاير الجعفرين	*Jezáïru-l-ja'farín,*	isle.	35.11	2.26	Bér.	The islands of the Beni Ja'far, usually called Za'farines, 440 feet high.
— الغنم	*Jezáïru-l-ghanem,*	islands.	35.34	1.12	Bér.	Sheep-islands off Cape Fegalo.
— الحبيب	*Jezáyiru-l-habíb,*	islands.	35.44	1. 8	Bér.	Friend's islands, 308 feet high.
جدانه	*Judánah,*	tribe.				

K.

Arabic	Name	Type	Lat.N. ° ′	Long.W. ° ′	Authority.	Etymologies and Remarks.
قبايل	*Kabáyil,*	tribes.				Plur. of Kabileh.
كبار	*Kabbár,*	tribe.				Crowd, an onset upon the field of battle.
قيصر	*Kaisar,*	village.	32.50	6.50	W.	The Latin word Cæsar. Foundations of a town probably ancient
قلعة عبده	*Kal'at-'Abdah,*	castle.	32.15	8.30		The castle of Abdah.
قلعة الواد	*Kal'at-el-Wád,*	town.	35. 0	2.15		The castle of the river, *i.e.* of the Muluyah, the *castellum mediocre* of Sallust.
قلها	*Kalhá,*	m. & vill.				Filthiness, and a hovel.
قنطره	*Kantarah,*	bridge.	35.12	5.50	W.	A bridge.
كنتي	*Kantí,*	ruins.	32.30	9.13		Ancient town described by Leo and Marmol as giving the name to Cape Cantin.
كركال	*Karkál,*	island.	35.20	1.30		Edrisi's *Kushkar*?
كرس	*Kars,*	village.	32.30	3.30		Gers is a Berber corruption of Kasr.
قرية	*Karyah,*	ruined town.	33.12	7.10	W.	Signifies a town, a village, a hamlet.
قصبة عيث اوسي	*Kásbat 'Aith u'sí,*	castle.	33.15	4.30		The stronghold of the tribe Aith-usi.
— علي بن حسن	—*'Ali-ben-Hasan,*	id.	33.30	7.20	W	The palace of Ali, son of Hasan.

			Lat. N. ° ′	Long. W. ° ′	Auth.	*Etymologies and Remarks.*
قصبة دكاله	*Kaṣbaṭ Dukkálah,*	castle	32.40	8.20		The castle or chief town of Dukkala, *alias*, El Medina.
— الزتات	— *-ez-Zettát,*	id.	33. 0	7. 0	W.	The castle of the bridal ornaments. *Ar.*
— جزوله	— *Juzúlah,*	id.	30.15	8. 0		The castle of the province or tribe Gezula, the ancient Gætulians?
قصبة	*Kaṣbah,*	id.	34.15	2.45		A small town, or citadel. Alkasabah.
قصر العلوين	*Ḳaṣr-el-'Alewín,*	town.	32.30	3.30		The castle of the descendants of 'Ali (Bekri, p.538).
— فرعون	— *Far'aún,*		34.45	5.15		Pharaoh's castle (in ruins).
— ابن حميد	— *Ibn Ḥamíd,*	castle.				The castle of Ben Hamid.
— مصموده	— *Maṣmúdah,*	town.	35.50	5.36		The palace of the Masmudah tribe; now *Al Kassar Saghir.*
— مولاي ميمون	— *Múláï Meïmún*	fortress	35. 8	2. 8		
قراقر اولاد عيسي	*Ḳaráḳer Aúlád I'sa,*	distr.	32.55	8.45		The driving sands of the children of I'sa (or Jesus) a Berber tribe.
كرموت	*Keremút,*	plain.	31.45	9.30		Plains at the N. West foot of the Iron mountains.
كتامه	*Ketámah,*	tribe.				A great tribe of Berbers.
قزوله	*Ḳezúlah,*	tr. & prov.	30.15	8. 0		Pronounced Gezulah. Gætulia?
خامس مطغاره	*Khámis Meṭghárah,*	town	33.59	5.20		Thursday market of the tribe and mount Metgharah.
خندق الريان	*Khandaḳu-r-riyán*	torrent	35.45	5.40		The thirst-quenching foss.
خربات	*Kherebát,*	village.				Desert places or ruins.
كيكرو	*Kíkrú,*	river.	33.45	6.15		Tributary to the river Abu Rak-rak, or Bu-Regreg.
قراط	*Ḳiráṭ,*	cape.	35.20	3.37		Cape Quilates on the North Coast.
قروان	*Ḳirruwán,*	tribe.	33.40	3.40		Pronounced *Kirwan.*
كتيوه	*Kittíwah,*	tr. & vil.	29.45	9. 0		Lisping, stammering.
قليعة	*Ḳoleï'aṭ,*	village.	31.10	9.45		The little castle.
قصير	*Ḳoṣaïr,*	village.	32.32	2.45		A little palace.
قناغ الغربان	*Ḳunágh-el-gherbán,*	mt.	33.20	3. 0		The passage of the ravens.
كتبية	*Kutubíyah,*	mosque.	31.38	7.36	B.	The library. The chief mosque at Marocco; the tower 220 feet high.
قزت	*Ḳuzt,*	tribe.	34. 0	3. 0		The fourth part, quarter. *Ber.*
القلاوي	*El Keláwí,*	mount.	31.20	7. 5		Mountain ridges; plur. of Kilwah.
الخنق	*El Khenḳ,*	defile.	32.15	3. 0		Strangling, strangulation, thence a defile.
الخيمه	*El Khaïmah,*	village.	33.15	4. 0		The tent.
الخوس	*El Khús,*	river.	34.50	5.17		The conspicuous.
القوس	*El Ḳús,*	river.	35. 0	6. 0		A bow.

		L.	Lat.N. ° ′	Long.W. ° ′		Etymologies and Remarks.
لهانه	*Lahánah,*	tribe.				Breakfasting, liberal to travellers.
لمايه	*Lamáyah,*	id.				
لمطه	*Lamṭah,*	id.&town.	28.30	10.30		One of the chief Berber tribes.
لمتونه	*Lamtúnah,*	id.	28.30	9.30		*Idem,* famous in history.
لوسكپاكين	*Leúsugágan,*	town.				
لواته	*Lewwátah,*	tribe.				One of the primitive Berber tribes.
ليونه	*Liyónah,*	cape.	35.54	5.		On the Strait of Gibraltar. Leona, *Span.*
		M.				
مادراوام	*Mader awwám,*	town.				The ancient *Dorath.*
مديونة	*Madyúnah,*	tr. & vil.	33.30	7.25	W.	Noted for its sok or market. Also a Berber tribe.
مفروسين	*Mafrúsín,*	river.	34.15	5. 0		The river of Fas.
مغاره	*Maghárah,*					A cavern.
مغيله	*Maghílah,*	village.				A wet nurse.
مغوغه	*Maghóghah,*	tr. & vil.	35.46	5 43		
مكيران	*Magrán,*	mount.	32.45	5.15		
مهايه	*Maháyah,*	tribe.	34 40	2.20		
ماجر	*Májer,*	tribe.	32.30	9. 0		
ملباطه	*Mallabáṭah,*	cape.	35.49	5.45		See *Rasu-l-Menar.*
معموره	*Ma'mórah,*	town.	34.54	6.24		Full built, or inhabited: now only a few tombs.
منصوريه	*Manṣóríyah,*	town.	33.46	7.16		The victorious place.
مراكش	*Marákesh,*	city.	31.37½	7.36	W.	Vulgo Maraksh. The city of Marocco.
مريزان	*Marízán,*	mount.				
مرنيسه	*Marnísah,*	tribe.				
مرطيل	*Marṭíl,*	river.	35.40	5.17		River and tower of Tetuan.
مصموده	*Maṣmúdah,*	tribe.				One of the five principal Berber tribes.
مستالثه	*Massetálithah,*	mount.	33.15	5.15		
مطماطه	*Maṭmáṭah,*	tribe.				Extension.
مزاري	*Mazárí,*	point.				Strong, sturdy, valiant. *Ar.*
مزيغن	*Mazíghan,*	town.	33.15	8.26	A.	Vulgo *Mazagan*; the abode of the Amazigs.
مدغره	*Medgharah,*	district.	31.45	3. 0		Invasion.

			Lat.N. ° ′	Long.W. ° ′	Auth.	*Etymologies and Remarks.*
مدينة البيضا	*Medínatu-l-beïḍá*,	town.	34. 6	4.58	B.	The white city, the city of Fas.
مهدية	*Mehdíyah*,	town.	34.18	6.38	A.	Walled town on the Atlantic, pop.400. Mamorah.
مهدومة	*Mehdúmah*,	town.	33.16	8.26		Destroyed, or no more existing; a term formerly applied to the town of Mazighan.
مهردة	*Meherdah*,	village.	35. 8	1.55		Near Cape Hone.
محكسة	*Meḥkisah*,	tribe.	35.30	5.30		Tribe near Tetuan, towards Ceuta.
مجاسة	*Mejásah*,	mount.	34.15	4.46		Searched.
مليلة	*Melílah*,	tr. & town.	35.22	2.52		Town and gulf on the Mediterranean. Spanish presidio.
منجاسة	*Menjásah*,	mount.				Impure.
منزلة	*Menzalah*,	oratory.				Halting or alighting place.
مرامر	*Merámer*,	town.	32.30	8.55		Marbles.
مرشان	*Mershán*,	pl. & vil.	35.48	5.48		Free and open pasture ground.
ماسة	*Mésah*,	town.	29.45	9.45		Place for prayer.
مشرع الاشاف	*Meshra'-el-ashéf*,	ford.	35.33	5.50	W.	The healing watering-place
مشرع حلوف	*Meshra' Hallúf*,	ford.	32.30	6.45	W.	The ford of the wild boar.
مشرعة الرملة	*Meshra'aṭ-er-ramlah*,	pl.	34.30	6.15		The sandy ford, extensive plains so called North of the Wad Sebu.
مشراعة اسفي	*Meshra'aṭ esfú*,	ford.	32.30	6.15		The ford of the light-loaded mules.
مسطاسة	*Mesṭásah*,	tribe.	35. 8	4.25		Hisn Mestasah, the fort Mestasah, the ancient Acrath.
مزاتة	*Mezútah*,	tribe.				Oil-venders.
مزمة	*Mezemmah*,	town.	35.10	3.50		Or *Deirat Mezemmah.*
ماية	*Miaṭ*,	village.	32.20	6.50	W.	One hundred.
ماية بير	*Miaṭ Bír*,	wells.	33.15	3.45		Hundred wells.
مكناسة	*Miknásah*,	city.	33.58	5.30	B.	A broom.
ملثين	*Milthín*, (*Miltsín*)	mount.	31.10	7.25	W.	The highest peak of Atlas south of the city of Marocco, rising 11,400 feet above the sea.
مسفيوة	*Misfíwah*,	district.	31.20	7.30		The windy or purified region.
مشبوية	*Mishbóyah*,	tribe.	28.45	10.45		Tribe of Shelubs. Stung by scorpions.
مكدور	*Mogadór*,	city.	31.30	9.47		European pronunciation of Mugdul, or Modogul, a Moorish saint (Host. p. 71).
مغرب الاقصي	*Moghribu-l-Akṣa*,					The extreme west — the empire of Marocco.
مغرب الاوسط	*Moghribu-l-Ausaṭ*,					The middle-western region —Algiers and part of Tunis.
مجاهدين	*Mojáhidín*,	tombs.	34.45	5.50		The warriors of the faith; tombs of three saints near Tangier.
مقراوة	*Mokráwah*,	tribe.	32.45	3.45		*Mograwah*, foreigners, new comers.

			Lat.N. ° ′	Long.W. ° ′	Authority.	Etymologies and Remarks.
منسلمين	*Monselmín,*	tribe.	28.15	10.45		Strolling Mohammedans. Corrupt for Muselmin.
مرشه	*Morshah,*	lake.	34.30	6.30	W.	The lake or morass of Ras-ud-daura.
مرشانه	*Morshánah,*	village.	33.15	7.15		Open pasture ground.
مصيد عيث ارمه	*Moṣíd 'Aith-Irmah,* vill.					The hunting-place of the tribe Aits Irmah.
مطفيه تيدسي	*Motfiyah Tídsí,* hamlet.					The well of Tidsi.
مولاي ابوسلم	*Múlái-abú-sellum,* cape.		34.54	6.24	A.	My lord Busellum, *i. e.* Father-ladder. Old Ma'morah.
مولاي ادريس	*Múlái Idrís,*	town.	34.30	5. 0		My lord Idris, or Enoch. Town and sanctuary.
ملوحة	*Mulúḥaṭ,*	river.				Salt water.
ملوكه	*Mulúkah,*	tomb.	32.36	9,10		
ملولوا	*Mulúló,*	river.	34.30	3. 0		
ملويه	*Mulúyah,*	river.	35. 8	2.16		
مزوبه	*Muzzúbah,*	tr. & town.	29.15	6.40		

N.

نكور	*Nakkór,*	river.	35.15	3.45		
نرنجه	*Naranjah,*	village.	34.50	5.20		Orange.
نفيفه	*Nefífah,*	tr. & riv.	31.15	7.55		Vulgo *Enfifah.*
نفيسه	*Nefísah,*	tr. & riv.	31.30	7.45		Vulgo *Enfisah.*
نفوس	*Nefús,*	mount.	31.45	5.30		
نفوسه	*Nefúsah,*	tribe.				Ancient Berber tribe.
نفزاوه	*Nefzáwah,*	tribe.				One of the chief tribes of Berbers.
نيحه	*Níḥah,*	river.				The quiet river.
نخيله	*Nukhaïlah,*	town.	33.15	6.45		A little Palm, the ancient Occath, one of the most important market towns of Marocco.
نون	*Nún,* or *Núl,*	town.	28.30	10.30		Eels; Nun of the tribe of Lamtah.
نزل الطروان	*Nuzulu-t-Ṭirwán,* village.		32.40	3.45		A halting-place or covert for strangers from distant places, Caillie's Nzéland [Nuzlan].

O.

عماره	*'Omárah,*	tr. & vill.				Habitation.
اردوم	*Ordóm,*	river.	34.15	6. 0		Become green again.

R.

رباط	*Rabáṭ,*	port.	34. 3	6.48	A.	Inn or monastery. Walled town, pop. 21,000.
رباط الفتح	*Rabáṭu-l-fet-ḥ,*	id.				Resting place of victory.

			Lat.N. ° ′	Long.W. ° ′	Authority.	*Etymologies and Remarks.*
رحاله	*Rahálah,*	tribe.	29.45	8.45		Travellers.
رهونه	*Rahónah,*	tribe.	34.55	4.50		Vulgo: Arhonah.
راس افرني	*Rás Aferní,*	cape.	30.38	9.52	A.	Called also Cape Ghir, a bluff cape rising boldly 1,235 feet above the sea.
— ازنتور	— *Azintúr,*	id.	35.34	1.14	Ber.	Cape Fegato on the Mediterranean, Ras-ul-Kintar.
— تفلنه	— *Tafalneh,*	id.	31. 7	9.50	A.	A bold cape on the Atlantic, rising 780 feet above the sea.
— تكريولت	— *Tegríwelt,*	id.	31.24	9.48		The handsome promontory, Cape Sim.
— العين	— *-ul-'Aïn,*	spring.	31.50	7. 0	W.	The chief spring, a common name in Barbary.
— الدوره	— *-ud-Daúrah,*	id.	34.45	6.24	A.	The round cape, a low sandy cape on the Atlantic which gives its name to the adjoining lake.
— الدير	— *-ud-Deïr,*	cape.	35.30	2.57		Cape Tres Forcas of the Spaniards, ancient Rusadirum.
— الحديق	— *-ul-Hudik,*	id.	32.32½	9.17	A.	Cape Palm-grove, also Cape Cantin.
— الجمل	— *-ul-Jemel,*	id.				Cape camel.
— المنار	— *-ul-Menár,*	id.	35.48	5.45		Cape lighthouse. Cape Malabat, the eastern cape of the bay of Tangier.
— الشقار	— *-ush-Shakkár,*	id.	35.47	5.54	A.	*Cape Spartel* of our maps, the extremity of vegetation, and especially of vines.
— السيم	— *-us-Sím,*	id.	31.24	9.48		The windy cape, or the promontory of the tribe Sim, or *Aits-i-Sim*, the sons of the passing winds.
الواد	*-ul-Wád,*	river.	30.15	8.45		River-head.
ريف	*Ríf,* or *Er-Ríf,*	province.	35. 0	4.30		Mountainous well cultivated province on the Mediterranean.
رهامنه	*Riháminah,*	province.	31.15	8. 0		
رقبه ذي الجمل	*Rukbah dhí-l-Jemel,*	defile.	35.20	5.55	W.	The camel's neck.

S.

صدراته	*Sadrátah,*	tribe.				Astonished.
سهل المرغه	*Sahel-el-Marghah,*	plain.	34. 0	4.30		A plain of grassy pasturage
ساحل	*Sáhil,*	coast.	35.30	6. 0		Level, sea shore, sea-coast.
ساحلي	*Sahilí,*	tribe.	35.30	6. 0		Coaster.
ساقيه	*Sákiyah,*	village.				A water-course or water-wheel.
سلا	*Salá,*	town.	34. 3	6.48	A.	Sallee of our maps. A walled town on the Atlantic, pop. 10,000. Secure and quiet place.
صميره	*Samírah,*	plain.	32.10	8. 5	W.	Spreading water, well-watered fields.
صنهاجة	*Sanhájah,*	tribe.	32. 0	5. 0		One of the great divisions of the Berbers.
سانيه	*Sániyah,*	well.	35.30	5.50	W.	A water-bearing camel. In Marocco and in the whole of Barbary, a large garden
صرحون	*Sarhún,*	mt.&edifices.	34.45	5.20		The two palaces, *viz.* Kasr Faraun and Tiyulit or Mulai Idris.

			Lat.N. ° ′	Long.W. ° ′	Authority.	*Etymologies and Remarks.*
صرصر	*Sarṣar,*	hill.	34.45	5.45	W.	Conical hill 800 feet above the plain, *Sarsar,* a cricket.
صومع حسان	*Ṣauma'ahḤaṣan,*	tower.	34. 2	6.47	W.	Tower at Rabat, 250 feet above the sea.
سبت الميمونيه	*Sebt-ul-Maï-múníyah,*	garden.	31.37	7.36	W.	Garden of repose, or of Maimun, in the city of Marocco.
سكمه	*Seggemeh,*	mount.	33. 5	4.45		
سكرت	*Sekort,*	river.				Heat of the sun.
سكسيوه	*Seksíwah,*	mount.	31.45	7. 0		
سليلكو	*Selílgó,*	mount.	33.30	4.15		
سروق	*Serúḳ,*	river.				Thief, robber.
سساون	*Sesáwan,*	mount.	35. 0	5. 0		
شرف العقاب	*Sharf-el-'Oḳáb,*	hill.	35.36	5.56		Eagle's peak.
شرف اليهودي	*Sharf-el-Yehúdí,*	cliff.	32.15	9.15	A.	Jew's cliff. A red cliff on the Atlantic rising 284 feet above the sea.
شف الشفره	*Sharf-esh-Shofrah,*	cliff.	32.56	8.45	A.	Spear's edge. Cliff on the Atlantic about 400 feet above the sea.
شرقية	*Sharḳíyah,*	tribe.	35. 0	4 30		Eastern tribes.
شولن	*Shaúlán,*	baths.	34. 0	4.25		Lifting up the pitcher.
شاوس	*Sháwes,*pron.*Shâus,*	prov.	33.30	3. 0		A rough uncultivated country.
شاوي	*Sháwí,*	village.	34. 0	2.30		The abode of the sheep-owner.
شاويه	*Sháwíyah,*	tr. & prov.	33.30	7. 0		The remains of dispersed men and cattle.
شدمه	*Shedmah,*	province.	31.45	9. 0		Strong horses and camels.
شجريه	*Shejeríḳah,*	village.				Abounding with small trees.
شله	*Shellah,*	sanctuary.	34. 0	6.45		End of a journey, pilgrimage; Kobbeh near Sala.
شراغنه	*Sherághinah,*	province.	32. 0	7. 0		
شريج	*Sheríj,*	village.	35.49	5 55		A grove, shaded by small trees.
شرادي	*Sherrádí,*	sanctuary.	31.30	8. 0		Fugitive.
ششوان	*Sheshwán,*	town&dist.	35.10	5.20		
شلحه	*Shilḥah,*pl.*Shulúh,*	nation				A branch of the Amazighs, and the name of their language.
شيشوه	*Shíshawah,*	riv. & pl.	32. 0	8.30		Distant. A tributary of the Tensift.
سعبة اقلو	*Sho'baṭ Aḳlú,*	valley.				Valley of Aklu, formed by a torrent.
شعبة بني عبيد	*Sho'baṭBení' Obaïd,*	vall.	33. 0	3.45		Valley of the Beni 'Obaid.
شفره	*Shofrah,*	village.				A large knife.

			Lat.N. ° ′	Long.W. ° ′	Authority	*Etymologies and Remarks.*
سيدي قاسم	*Sídí Ḳásim,*	village.	34.15	5.54		My lord Kasim.
سيدي كسكسو	*Sídí Kuskusú,*	ḳobbeh.	32.50	8.50		A saint's tomb where *kuskusu* was given to travellers.
سيدي مختار	*Sídí Mokhtár,*	village.	31.44	8.30		My lord elect or chosen.
سجلماسة	*Sijilmésah,*	district.	31. 0	2.30		
سلفت	*Silfat,*	mount.	34.30	5.45	W.	The brother's wife.
صفروي	*Ṣofrowí,*	town.	33.48	4.45		An empty house.
سوق	*Sóḳ,*pl.*Aswáḳ,*	market.			•	Applied to many places in Marocco.
سوق دارعيث ثانه	*Sóḳ-dár-'aith-Thánah,*	id.	35.15	5.15	W.	Market of the house of the Thanah tribe.
سوق الاربع	*Sóḳ-el-Arba',*	market.	34.34	5.45		Wednesday-market.
سرب الهرب	*Sorbu-l-Herb,*	river.	33. 0	4. 0		The road of the flight.
ستوكه	*Sutúkah,*	tribe.	29.30	10. 0		Properly *Istukah.*
سبيت	*Subeït,*	town.	33.15	8. 0		
سبيته	*Subeïtah,*	tribe.				
سوس	*Sús,*	province.				The origin, the limits, the border.
سوس الادني	*Sús-el-Adna,*	id.	30. 0	9. 0		Lower Sus, *i. e.* lower border.
سوس الاقصي	*Sús-el-Aḳṣa,*	id.	29. 0	9.30		Furthest Sus;—extreme border. 33.30 6.0?
سوينيه	*Suweïníyah,*	village.	31.50	7.40	W.	The small wells or pits.
صويرة	*Ṣuweïrak,*	town&port	31.30	9.47	A.	*Mogodor*, miniature, a little picture.

T.

			Lat.N.	Long.W.	Authority	Remarks
تبرنست	*Tabornost,*	village.	30. 0	6.15		The cloak with a hood. (The Bornos).
تبلاونت	*Tabuláwant,*	village.	32.45	7.15		The abode of the ferrymen *Ber.*
تفالنه	*Tafélneh,*	cape.	31. 7	9 50	A.	Barren, without water. A cape 780 feet above the sea.
تافيلالت	*Táfílélt,*	region.	31. 0	2.30		The abode of the *Fileil. Ber.*
تفراطه	*Tafráṭah,*	desert.	34.15	3. 0		Preceding others, going before, the door, or gate. *Ber.*
تفتانه	*Taftánah,*	village.	31. 0	9.45		The trial, the attempt. Temptation, seduction.
تكراين	*Taggaráyin,*	mount.	31.20	7.20	W.	Defile in a mountain. A Sheluh, vill. and mount. 6,400 feet above the sea.
تكداست	*Tagodást,*	town.	32. 0	6. 0		
تكمدارت	*Tagumadárt,*	village.	29. 0	6.30		
تجكانت	*Tãjakánt,*	tribe.	30. 0	7. 0		
تالانت	*Tálént,*	town.	29.15	9.45		The residence. *Ber.*

			Lat.N. ° ′	Long.W. ° ′	Authorities	Etymologies and Remarks.
تالانت عيث ﭙزاري	*Tálént'aith-Gerúri*, vil.					The chief abode of the Aits Gerari.
تمرقسط	*Tamarakost*,	village.	32.15	3.15		Tamarakosht?
تمزيغت	*Tamazight*,	language.				The language of the Amazighs.
تامنارت	*Támenárt*,	district.	30.50	9. 0		The minaret, the plain. *Ber.*
تمسكت	*Tamsukt*,	river.	32.15	6. 0		The moistener.
طنين	*Ṭanín*,	river.	34.30	5.45		Full of reeds.
طنجه	*Ṭanjah*,	city.	35.48	5.48	A.	A place amidst vines. *Ber.*
تنسيفت	*Tansíft*,	river.	32. 4	9.23		Full, overflowing, the central or middle river.
طنصور	*Ṭanṣúr*,	village.				The well defended.
طرف الحرشا	*Ṭarfu-l-Ḥarshá*, cape.		35.46	0.48		Cape Falcon. Cape of the chace, or of the Lybian lizard.
طرف القراط	*Ṭarfu-l-ḳirát*,	cape.	35.20	3.37		On the Mediterranean. Cape Quilates, cape of the Carats, or Carobs.
طرف الشقار	*Ṭarfu-l-Shaḳḳár*, cape.		35.47	5.54½	A.	The red promontory. Cape Spartel, with village and ruins of the same name.
طرقه	*Ṭarḳah*,	village.	32.45	7.30		A rapid stream. *Ber.* Pl. Tuwarik, a name of a Berber tribe
تارودانت	*Tárúdánt*,	town.	30.15	9. 0		The beautiful woman. *Ber.*
تسرموت	*Tasremút*,	ruins.	31.25	7.20	W.	Extensive ruins of a town in the Atlas, 3,000 feet above the plain of Marocco.
تاتا	*Tátá*,	station.	28.45	6.30		Kafileh station on the northern limit of the Sahra.
تاونت	*Táwant*,	village.	35. 8	1.46		Boundary on the Mediter. coast between Algiers & Marocco, cliff, steep rock, or precipice.
تازي	*Táza*,	town.	34.15	3.45		A town. *Ar.* and *Ber.* A collection of houses.
تازوت	*Tázút*,	town.	30. 5	3.10		
تبلبلت	*Tebelbelt*,	village.	30.15	2.15		Confusion of languages.
تادله	*Tédlah*,	province.	33. 0	5. 0		The rising country.
تادناست	*Tédnést*,	town.	31.45	9. 0		
تدسي	*Tedsí*,	town.	30.15	8.15		Secluded.
تفنه	*Tefnah*,	river.	35.17	1.28	Bér.	Muddy water. *Ar.* Sunset, and West. *Ber.*
تفرن	*Tefren*,	mount.				
تفوف	*Tefúf*,	village.				Smoke. *Ber.*
تفزه	*Tefzah*,	town.	32.15	5.30		Sandy, or full of sandstones *Ber.*
تفزاره	*Tefzárah*,	river.	35. 0	1.15		Running through the sand.
تغاسه	*Teghásah*,	village.	33.30	2.45		
تغجت	*Teghejet*,	town.	32.30	7. 0		A column. *Ber.*

			Lat.N. ° '	Long.W. ° '	Alt.	*Etymologies and Remarks.*
تغثوت	*Teghthút,*	old port.				On the west of Haha.
تاهرت	*Téhart,*	village.				In the province of Gart.
تجوت	*Tejeut,*	village.	30.15	9.15		
تاله	*Télah,*	village.	31.30	9.30		A covered fountain.
تلالين	*Teláleïn,*	village.	32.30	3.15		The two sandhills.
تمسوين	*Temessuwín,*	castle.	34. 8	3.40		The two fires. *Ber.*
تامسنا	*Témsená,*	tr. & prov.	33.30	7. 0		Country laid waste, the desert. *Ber.*
تانداست	*Ténedást,*	mount.	32. 0	5.30		
تانكانت	*Ténegánt,*	village.	31.15	2.15		
تناثه	*Tenéthah,*	village.	31. 0	8. 0		
تنسبته	*Tensíṭah,*	mount.				
تنزاره	*Tenzárah,*	mount.				
ترناطه	*Ternáṭah,*	district.	35.13	1.33		
تسكدالت	*Tesegdélt,*	town.	31. 0	9.30		Eggs. *Ber.*
تسلاكت	*Teselégt,*	village.	29.30	9. 0		Silver and copper mines found here.
تاست	*Téset,*	district.	29.30	9.30		The country watered by the river Assah. *Ber.*
تسوين	*Tesewín,*	mount.				
تشيم	*Teshím,*	river.				
تطاون	*Teṭáwin,*	city & port	35.38	5.22		Eyes. The plural of the Berber word Tit, vulgo Tetuan.
ثاكوت	*Thágúth,*	pass.	33.15	4 45		The old woman.
ثموده	*Thamúdah,*	village.				A boar.
ثاولالين	*Tháwulálín,*	tribe.				Herdsmen.
تيلدات	*Tíldát,*	mount.				
تيلديه	*Tíldiyeh,*	village.				
تليمه	*Tillímeh,*	village.				
تلمسان	*Tilimsán,*	town.	35. 0	1.15		Capital of a district called by the Spaniards Tremecen.
تملين	*Timillín,*	village.				
تيموري	*Tímúrí,*	tribe.				Date trees. Aits-Timuri.
تينمال	*Tínamál,*	village.				Or Tinmalt.
تيط	*Tíṭ,*	ruins.	33.10	3.30	A.	An eye. *Ber.*

			Lat.N. ° ′	Long.W. ° ′	Authority	Etymologies and Remarks.
تيوليت	*Tiyúlít,*	town.	34.30	5. 0		Al-Guwallili, now Mulai Idris.
تزيتيت	*Tizítít,*	tribe.				
تمارة	*Tomárah,*	village.	34. 0	6.50		Fruit trees.
توات	*Tuwát,*	station.	27. 0	1. 0 E.		Oasis and kafileh station in the desert.
		U.				
اوفران	*U'farán,*	tribe	29. 0	9.45		
اولوت	*U'lút,*	tribe.	35. 0	6.15		
ام الهدجا	*Ummu-l-hudajá,*	village.				Mother of camel's shriek.
— الحفان	*— -l-ḥeffán,*	id.				Mother of the young ostrich.
— الجنيبة	*— -l-janíbah,*	id.				Mother of one of the camel loads.
— الربيعة	*— -r-rebí'eh,*	river.	33.17	8.17		Mother of spring plants.
		W.				
واد	*Wád,*	river.				Pl. Audíyah,—in Marocco, Widan.
— بوسناكة	*— Bú-Sinágah,*	id.	33.50	7.10		
— العرسة	*— -el-'Arsah,*	id.	33.40	7.25	W.	The river of the orchards.
— العياشة	*— -el-'Ayyáshah,*	id.	35.32	6. 0		The life-giving (stream).
— الغرض	*— -el-Ghoreḍ,*	id.	31.29	9.47	A.	The river formed by rain-water, not always full.
— الحلق	*— -el-Halḳ,*	id.	35.45	5.45		The river of the mouth or throat.
— الجواهر	*— -el-Jewáhir,*	id.	34.15	5. 0		The river of jewels.
— المحسن	*— -el-Maḥsan,*	id.	35.10	6. 5	W.	The benefactor.
— المايلة	*— -el-Máïlah,*	id.	35.30	1.15		
— المال	*— -el-Mál,*	id.				The river of riches.
— الملة	*— -el-Millah,*	id.	33.40	7.25		Sect-river.
— التنين	*— -el-Tinnín,*	id.	34.30	5.45		Dragon-river.
— اليهود	*— -el-Yahúd,*	id.	35.48	5.50		Jew's river.
— النفيس	*— un-nefís,*	id.	31.30	8. 0		The precious river.
— اركيلة	*— Ergílah,*	id.	34.30	4.30		The arm. *Ber.*
— كرط	*— Gárṭ,*	id.	35.15	3.15		The river of karats or carobs.
— غمارة	*— Ghomárah,*	id.	35.15	4.15		The river of the Ghomerahs.
— كير	*— Gír,*	id.	32. 0	2. 0		Passage, alley, entry.

			Lat.N. ° ′	Long.W. ° ′	Auth.	*Etymologies and Remarks.*
واد عيسوي	*Wád 'Ísawí,*	river.	32. 0	9. 0		Isawi River.
— كركل	— *Kerkal,*	id.	35.15	4.45		The river of frogs.
— لوان	— *Levén,*	id.	34.15	5. 0		The coloured or variable river.
— ملويه	— *Mulúyah,*	id.	35. 8	2.16		The winding river.
— نون	— *Nún,*	id.	28.40	11.10	A.	The river of eels. The position of the mouth of the river that falls into the Atlantic near Cape Nun is here given, whether it be Wad Nun or Wad Soleïman seems doubtful.
— ساحل	— *Sáḥil,*	id.	35.15	6.15		
— سبوا	— *Sebú,*	id.	34.18	6.40	W.	The mountain river, the torrent.
— صاع	— *Ṣá',*	id.	34.30	2.30		A tributary to the Muluyah.
— تافنه	— *Táfnah,*	id.	35.17	1.28		The sunset.
— تنسيفه	— *Tensíft,*	id.	32. 4	9.23	A.	The overflowing river, central river.
— تدسي	— *Tidsí,*	id.	31. 0	9.45		Concealed, or hidden.
— تيلدي	— *Tíldí,*	id.				
— العبيد	— *u-l-'Abíd,*	id.	32.30	6.15		Slave river.
— ارلكوس	— *Ulkós,*	id.	35.13	6. 8	W.	The Luccos of our maps.
— ورغه	— *Werghah,*	id.	34.15	5.30		
— يتكم	— *Yetkom,*	id.	33.55	7. 0	W.	
— يسل	— *Yissil,*	id.	31.40	7.30	W.	Rush River.
— زيز	— *Zíz,*	id.	32.30	4. 0		
وهران	*Wahrán,*	town.	35.41	0.40	Bér.	*Oran,* town and port on the Mediterranean.
والديه	*Wálidíyah,*	castle.	32.45	9. 0		
وانسيفن	*Wánsífen,*	spring.	32.45	5. 0		Source of the river Ummu-r-rebieh.
وريكه	*Waríkah,*	town.	31.20	7.35		Aghmat Warikah.
ورتيغه	*Wartíghah,*	tribe.	33.40	3.20		
واسمن	*Wásman,*	tomb.				Tomb or kobbeh in the Jebel Hadid or Iron mountains.
وزين	*Wazeïn,*	town.	34.45	5.30		The abode or residence of a famous saint.
ولد	*Weld,*	child.				Pl. Aulad. Prefixed to many names of tribes.
وجيه	*Wijíyah,*	point & vil.	35.31	5. 7		Something very visible. *Ar.*
وجده	*Wujdah,*	town.	34.40	1.50		Vulgo Uchdah. Oushdah of our maps.
ولجه	*Wuljah,*	plain.	33. 0	8.45		Drinking. A water-bucket, a watery plain or valley.
وسطان	*Wusṭán,*	mount.				Intermediate.

			Lat.N. ° ′	Long.W. ° ′	Auth ity	Etymologies and Remarks
		Y.				
يافري	*Yáferí,*	village.				
يافوس	*Yáfús,*	tribe.				
ينفره	*Yanfarah,*	tribe.				
يسفاتن	*Yasfáten,*	mount.				
يلاس	*Yellés,*	village.	35.15	4. 0		
		Z.				
زواغه	*Zawághah,*	tribe.	33.15	6.15		Seducers.
زواوه	*Zawáwah,*	tribe.				A very ancient Berber tribe especially in Moghrib-el-Ausat.
زاويه	*Záwiyah,*	sanctuary				Pl. Zawaya. A retreat into which a devotee retires from the world.
— بن ساسي	*— ben Sásí,*	village.	31.20	7.20		The corner or retreat of Ben Sasi.
— بن شرادي	*— ben Sherádí,*	sanct.	31.30	8. 0		Noted sanctuary on the banks of the Wad Nefis.
— مولاي ادريس	*— MuláiIdris,*	town.	34.30	5. 0		The retreat of my lord Idris, founder of Fas.
زحبل	*Zeḥbel,*	village.				Dung or ordure of men and cattle.
زيتونه	*Zeïtúnah,*	town.	33.58	5.30		Plantation of olives. *Mik-nas.*
زناته	*Zenátah,*	tribe.				One of the principal and most populous Berber tribes.
زاره	*Zérah,*	village.				A place where reeds and canes grow.
زراره	*Zerárah,*	tribe.	32.30	6.45		Inflamed. Excellent graziers, or in raising and feeding camels.
زركو	*Zerkú,*	village.				Sandhill. *Ber.*
زينة	*Zeïnat,*	village.	35.38	5.40		Ornament, decoration. Vulgo, Zinat.
زهير	*Zoheïr,*	tribe.	33.30	5.14		Flowers, splendour, elegance.

M. Gråberg's original MS., which he has kindly presented to the Society, contains nearly double the number of names, which have been omitted here, partly because they belong to places of minor importance, but principally for the purpose of reducing the Vocabulary within such limits as are prescribed by the nature of this Journal.

XXI.—*Account of the recent exploring Expedition to the Interior of Australia.* By Major T. L. Mitchell, F.G.S., and M.R.G.S., Surveyor-General of New South Wales.

Having recently returned to England on leave of absence, after a residence of ten years in New South Wales, during which period I have surveyed that colony, and led three expeditions into parts previously unknown; I have much pleasure in submitting to the Royal Geographical Society the following brief account of these journeys, prefacing the narrative by a few observations on what had previously been done in exploring the interior, by my predecessor in office, and others.

In 1818, during a rainy season, Mr. Oxley, the late Surveyor-General, traced the course of the Macquarie to an inundation which he considered an inland sea. In 1829 (a dry season), Captain Sturt, pursuing Oxley's route, penetrated about a hundred miles farther, and was twice compelled to retire from the banks of a river of salt water, because no fresh water could be found.

In another direction, Mr. Oxley had, in 1817 (also a wet season), traced the river Lachlan, to an inundation similar to that which terminated his survey of the Macquarie; and he thereupon concluded that the whole country beyond was a marsh and uninhabitable. But, in 1824, the journey of Messrs. Hovell and Hume led to a more favourable conclusion, respecting the southern portion, at least, by the discovery of several large rivers, whose courses appeared to concentrate on the Murrumbidgee,—a river flowing nearly in the direction of that point to which Mr. Oxley had traced the Lachlan. In 1830, Captain Sturt embarked in a boat on the waters of the Murrumbidgee, which led him accordingly to the great channel of the streams which had been crossed by Hovell and Hume; and, by descending this large river, which had been named the Hume by Mr. Hume, and the Murray by Captain Sturt, he discovered its estuary in Encounter Bay. The Murray received a river from the north, supposed to be the Darling, but its waters were fresh and the identity remained a question.

Such was the state of Australian geography when General Darling left New South Wales in 1831. During the temporary government of Sir Patrick Lindesay another step was gained. A bushranger having been sentenced to suffer death for cattle-stealing, and who had been so long associated with the aborigines that he had acquired a knowledge of their language and means of subsistence, had related so plausible a tale respecting a very large river which he had followed in a north-western direction from Liverpool Plains to the sea coast, that the acting Governor was induced to despatch an expedition, under my command, to

examine the country on that side. The report drew more attention, at that time, as the course ascribed to the river Peel by Oxley and Cunningham, was quite at variance both with recent surveys and this man's description of it. The result of the journey was the discovery of the Karaula, or Darling, as a *fresh-water* river, in the latitude of 29°; and that its basin comprehended all the streams falling westward from the coast-range, as far north as that parallel; and that one of these, the Peel, flowed westward, and not northward, as supposed by Oxley and Cunningham. Limited as that excursion was by the unfortunate murder of two men and seizure of provisions by the aborigines, it afforded the means of demonstrating the advantages of angular measurement, and of devoting particular attention to the highest points of the country.*

The remarks on that journey, which appeared in the second volume of this Journal, may be best understood by comparing the course ascribed therein to the Peel, with that since laid down from actual survey. The looser maps of early travellers, so far from being a test of accuracy, are uncommonly erroneous in that spot; and the *names* first given, if doubtful in their application, for *that* reason, are of no consequence whatever, as they only lead, in such cases, to confusion.†

Captain Sturt undertook the survey of the interior by following up Mr. Oxley's discoveries, and tables of the number of miles explored by each traveller have been published on maps in England; but the officers of the surveying department had been extending across the country, from the Observatory at Paramatta, those more systematic operations which have left but few traces of such early journeys on the maps.

On leaving Sydney for the northern interior, I left in the hands of the engraver a trigonometrical map of the colony. Its wildest regions, which had been previously considered inaccessible, had not only been explored on the principles which I have since applied to the exploration of the interior, but they had also been surveyed, intersected by roads, planted with villages, and divided into counties, according to the boldest natural divisions, and yet of given extent. I could at length overlook the interior from a base of

* It is due to the memory of a very enterprising and talented officer, the late Captain Forbes, of the mounted police, that I should mention here his subsequent excursion to the banks of the Gwydir, accompanied by Lieutenants Maule and Finch. Captain Forbes traced the Gwydir to its sources near Mount Lindesay, and obtained much information respecting aboriginal names of localities, which he sent to me from India, and shall appear in my forthcoming map of these discoveries.

† The river to which Mr. Oxley gave the name of "Peel" could not be mistaken by me, as alleged in that paper, because it has, ever since Oxley's journey, been known by that name to the stockmen; and there is no other like it to the eastward.

"Communemque prius, seu lumine solis, et auras,
Cautus humum longo signavit limite mensor."

ranges, which had been traced through all their ramifications, and the satisfaction with which I then beheld the country behind these ranges reconciled me to the disappointment I had experienced in my early views of exploring the desert regions beyond them.

After that journey, in 1831, it was obvious that all the ranges to the southward of 29° S., with one exception only, terminated either on the interior plains, or were limited by the known courses of rivers. The only ridge south of 29° which could possibly prove continuous westward was that between the Macquarie and the Lachlan, and on the solution of this question depended the course of the Darling; for if the range had proved continuous the river must have turned, as many then thought it would, towards the north-western coast. The divergent courses of the Macquarie and Lachlan gave some weight to the opinion that they belonged to different basins, especially as they were separated by what Mr. Oxley termed " a very elevated range," which was seen by him extending westward, at a distance of seventy-two miles. Towards the head of this feature, on the east of Oxley's route, the mountain mass of the Canobolas, projecting westward so much farther than other branches from the coast-range, and its greater elevation (since ascertained by me to be 4461 feet above the sea), were facts in favour of such an hypothesis. In proceeding to explore, in 1835, the course of the Darling, by order of the British government, I availed myself of this range, as far as my instructions permitted; and thus I avoided the marshes of the Macquarie, and reached the farthest point previously attained on the Darling, without crossing a single stream.*

The chief discoveries of this journey were—

1st. The course of the Darling, which was surveyed for 300 miles (in direct distance) beyond the farthest point previously reached.

2nd. That the country beyond this river was intersected by ranges, the interior plains being ascertained to be of no great extent.

3rd. That Duck Creek is a principal channel by which the waters of the Macquarie reach the Darling.

4th. The whole course of the river Bogan, " Allan's Water " of Oxley; which was connected with " New Year's Creek " of Sturt, by tracing this river fully 300 miles. This was a line of considerable importance, as affording the means of access to the

* For an account of this journey, from the pen of the traveller who had preceded me, see " The Times " of 25th February, 1836, in which an error of nearly a degree of longitude is accounted for by the greater altitude of the sun in summer! In exploring, great accuracy could not be expected, but the remarks contained in that advertisement evince but little sympathy for a brother-traveller. The statements respecting the natives and the number of the party are incorrect. The positions and movements of the little party on the Darling required as much care as those of a *corps d'armée*. The extreme anxiety of its leader to conciliate the natives and avoid collisions, when at the same time occupied in surveying and drawing, can scarcely be imagined or understood by any who have not been in similar situations.

river Darling at all times; the chief impediments to travelling in Australia being the want of water in dry seasons, and too much of it during seasons of rain. Water is always to be found, at least in ponds, in the Bogan, and no floods can reach the rising grounds over the left bank of that river.

The death of the lamented Mr. Richard Cunningham, by the hands of the natives, deprived science of those discoveries which might have been expected from so able a botanist; nevertheless, the specimens brought from the Darling comprise some of a new and highly interesting character, and will be fully described in notes to my journal of these travels, by an eminent botanist.

The singular conduct and character of the aboriginal inhabitants (whose hostility at the termination of the journey had compelled the party, during my absence, to fire upon them in their own defence) exhibit human nature in some new and striking points of view, as will appear in the graphic illustrations which I am preparing for publication.

The grand object of that journey, however, was not accomplished; and on the following year a second expedition to the Darling was considered necessary to complete the exploration of its course.

In 1836 I accordingly again proceeded into the interior, when three years of drought had dried up not only every pool, but even the river Lachlan; which line, however, under such circumstances, I was compelled to follow, in order to accomplish the objects of that expedition: these were not confined to the Darling; my attention was also directed to the course of the Murray upwards, and the unknown country beyond it. Compelled to deal with the elements as we found them, I traced, although with great difficulty, from want of water, the Lachlan's channel to the Murrumbidgee, and the Murrumbidgee into the Murray. Establishing a depôt near the junction of the last two rivers for the repose and refreshment of the exhausted cattle, and leaving Mr. Stapylton and a party in charge of it, I continued my survey along the river Murray down to the junction of the river Darling, and this river upwards until I identified it with that from which the party had retired on the former year.

When absent from our depôt, the rain set in, the Murray rose, and when we were entangled in its rising back-waters, which formed large lakes, the same tribe of savages who had attacked the men on the Darling, now, in greatly increased numbers, surrounded this small party on the Murray. The measures of defence adopted under these circumstances were, fortunately for the lives of the party, successful, although they involved the painful necessity of firing upon the hostile natives.

On regaining the depôt on the Murray, which could only be

accomplished by swimming the horses over several deep reaches of the flooded river, the whole party crossed this large stream, the breadth of which was here 110 yards only, the current being very rapid. Exploring its course upwards, by proceeding along the left bank, we found that the outer banks, or *bergs*,* receded to a great distance from the river, the intervening *margins*† presenting a vast expanse, covered with reeds, which in some directions extended to the horizon. The ground on which these reeds grew was, however, firm, and the river did not lose its channel, although the reedy space was, in some parts, intersected by winding or serpentine reaches of still water. On arriving at a large lake named "Boga," in lat. 35° 26′ S., long. 143° 45′ E., the party found that the reedy expanse was contracted by grassy semicircular ridges, which formed the eastern side of remarkable circular basins or lakes, in most of which the water was salt, or brackish. The course of the main stream was again marked by trees, and, back from the river, towards the west, the country assumed a more favourable aspect, while to the southward and eastward of "Boga" it wore a park-like appearance, presenting extensive flats, covered with rich verdure, and watered by lagoons shaded by lofty trees.

At length, in long. 144° 20′ E. the party were once more gratified with the hopeful sight of mountains; the dead reaches debarred all access to the living stream, and I eagerly turned toward the south-west, to enter a perfectly unknown region. After surmounting the barriers of parched deserts and hostile barbarians, I had at length the satisfaction of overlooking from a pyramid of granite a much better country. The hill which I ascended, and named Mount Hope, was the most western extremity of a granitic range, extending from the south-east. A beautifully broken horizon in the south bounded plains which were then quite green, and gracefully wooded. It was no longer my hopeless task, as on the banks of the Darling, "to describe stagnation and delineate vacancy." Here, the party traversed a finely-variegated country, well watered, not only by streams from the south-east, but also by others from a lofty central mass which I named the Grampians of the South. These mountains appeared to water the country around them, without obstructing a free communication through it. The rain continuing, the soft rich earth materially impeded the progress of the drays through this fine region. The stock of provisions was reduced to a small quantity, while the progress of the party was, on some days, limited to one or two miles. When within forty

* † I here adopt the very useful terms recommended by Colonel Jackson, in his sensible paper on "Geographical Arrangement and Nomenclature," in the fourth volume of the Journal of the Royal Geographical Society.

miles of the highest summit of the Grampians I rode forward to it, leaving the animals to rest. Ascending, I distinguished it with the name of the Sovereign in whose reign that region which it overlooked had been explored. On this summit I passed a night, vainly hoping that the clouds would leave it. The thermometer stood at 27°, and having but little to eat, two of the four men accompanying me were taken ill, and only got down with much difficulty. At sunrise the clouds left this summit for a short time, and unveiled a scene of amazing grandeur, but by no means favourable for the operations of a surveyor. A sheet of clouds covered sea and land; with the exception of a few peaks.

The Wimmera, a river remarkable from flowing in several deep and continuous channels, rises on the north-eastern side of these Grampians, and after receiving various small tributaries in its course westward, to near Mount Howick, it then suddenly assumes a north-western course, which it was pursuing when abandoned by the party in longitude 142° E. The Glenelg receives all the waters falling south and south-west from the Grampians, and falls into the Southern Ocean in the deepest part of the curve between Cape Northumberland and Cape Bridgewater. Leaving the cattle to rest, in charge of a party under Mr Stapylton, and embarking with the rest of the men on this river, I reached the estuary in the boats, and was much disappointed to find it but a shallow outlet, the river for many miles having promised something better, by maintaining an uniform breadth of 100 yards, and an average depth of four fathoms.

As the party returned towards the southern skirts of the Grampians, I visited Portland Bay, where I found several whaling parties, and also an establishment on shore, where I had the good fortune to obtain, from Messrs. Henty and Co., a small supply of flour.

The country between the Grampians and the coast is chiefly of the trap formation. Extensive downs occur, which are covered with *danthonia*—the best kind of grass. Amygdaloidal rocks appear in hollows on these plains; and, further to the eastward, the party traversed a region of the most fascinating character, where the hills were smooth, verdant, and nearly all of a mameloid form, the rock composing them consisting wholly of lava. Mount Napier, situated between the Grampians and Portland Bay, contains a crater—the first hitherto discovered in Australia, and is surrounded for several miles by a rock which appears to be an ancient lava.

The Grampians of the south are situated between the latitudes of 36° 52′, and 37° 38′ N., and between the longitude of 142° 25′, and 142° 47′ E.; the latter being the longitude of Mount William, which is the highest and most eastern summit, being elevated

4500 feet above the sea. The other hills were so favourably situated for surveying the whole country, that I found no difficulty in carrying a chain of triangles along their summits from Portland Bay homewards, or in picking the way before me for the passage of drays through gaps in ranges, sometimes fifty miles a-head of the party, and from such summits tracing the general courses of the various rivers crossed by it. A range of grassy hills between the Grampians and the Alps I named the Australian Pyrenees—distinguishing the principal fixed summits with the names of Cole, Byng, Campbell, &c.

From Mount Macedon I reconnoitred Port Phillip at the distance of sixty miles*. In this region the party crossed ranges of granite, others of trap rock, the woods forming open forests which only partially covered the country. This, even in its present state, seems nearly all available for the purposes of agriculture and grazing; and being almost without any aboriginal inhabitants, it is consequently in the best state for the reception of British emigrants.

In point of latitude this extreme southern angle of Australia is preferable to any other portion, supposing other advantages equal. But the snowy mountains here temper the climate still more, and support throughout the summer the large rivers to which they give birth. The sea on three sides throws up clouds of moisture, and the general appearance of the country, duly considering these circumstances, induced me to distinguish this region by the name of "Australia Felix;" that is to say, the whole country situate to the southward of the river Murray.

I was anxious to have ascertained what harbours the coast afforded, but the difficulties we encountered in conducting the boats and heavy wheel-carriages over a country without roads, and during a very rainy season, allowed no time for the excursions which I meditated towards different parts of the coast, and especially to that portion between Cape Bernouilli and Cape Northumberland, which appeared to me to be the most promising, but which has never been well examined. Towards Cape Otway, also, I perceived, from the mountains, an extensive sheet of water, named "Cadong" by the natives.

The draught-oxen having become quite exhausted by the time they reached the southern extremity of the Grampians, I left Mr. Stapylton there, in charge of the bulk of the equipment and cattle, at a spot named Lake Repose, where they were to refresh during two weeks; while I, with a lighter party, explored the route homewards, and was thus enabled to send back to Mr.

* This hill has since been visited from Port Phillip, by the Governor in person, when my observations were verified by Capt. P. P. King, R.N., who accompanied his Excellency.

Stapylton a supply of provisions, which met this surveyor, as arranged, on the banks of the Murray.

Across all these mountain-ranges and rivers the boat carriage and the principal boat, both of which had been used on two expeditions, were carried safe back to Sydney. On this last occasion no lives had been sacrificed to the natives. On the contrary, six of the aborigines, male and female, had accompanied the party throughout the journey, and contributed most essentially to its safety and success. The whole distance, amounting to upwards of 2400 miles, was measured with the chain, and this measurement was connected with angular surveys, and observed latitudes, as much as circumstances permitted.

The general results of these three expeditions, however insignificant they may appear, compared to what the exploration of Australia on the same principles might have produced, are nevertheless sufficient to prove that the interior of the country is very accessible, and can be most easily explored by tracing the lines of high land.

The journeys hitherto undertaken, in order to follow out the courses of rivers, have led the travellers to those low levels which, in rainy seasons, have suggested the ideas of inland seas, and, at drier seasons, have been found still less accessible from the great scarcity of water, the level surface presenting no inequalities fit to contain much, still less heights to retain or condense vapour; but where, on the contrary, all the moisture is exposed to the evaporating power of extremely hot winds. The higher grounds are not subject to so many disadvantages, while the survey of them may be attended with more certain and satisfactory results. In wet seasons, chains of heights present the only accessible lines; almost every valley or ravine then contains water, while summits are secure from inundation. In dry seasons, on the contrary, the traveller may seek with some confidence among such elevations, so favourable to the condensation of moist clouds, for the springs which form the sources of streams; water being less exposed in the rocky bosoms of the hills to the effects of evaporation and absorption. By tracing the connexion of any high ground, the sources of the streams on each side thereof are ascertained, so that when such limits of their basins have been defined, any one may know where to look for the rivers arising therein; and, with a knowledge of the elevation, extent, and quality of the sources of rivers, we might appreciate their magnitude and the value of their deposits.

By proceeding in any *given* direction, besides the disadvantages attending both the want and the superabundance of water, at most seasons insurmountable, in the Australian interior, the geographical information obtained by such a course cannot be, at best, but

very imperfect. For whereas the course of a river, or the direction of a range, once ascertained and marked in its true place in the world's map, is an acquisition, one sure step gained towards a thorough knowledge of all the earth's features: from a line of route, on the contrary, which only crosses any number of streams and ranges at one or two points, no such permanent advantage is derived, but erroneous conclusions as to the course and identity of streams, or the direction of ranges crossed, are too frequently the only results. The knowledge thus obtained amounts to little more, indeed, than the fact—which might, without much hesitation, be assumed, respecting any extensive region not quite a desert—namely, that it *is* intersected by streams and ranges, *whose sources and direction are unknown.*

By tracing out the different ranges which branch into the interior from the eastern coast range, and thus either discovering what high land unites the hills of Eastern and Western Australia, and divides the waters falling north and south, or the non-existence of any such high land, we should in either case break up the blank map thereof. All other questions seem subordinate to this, as the extent of the basins of any rivers on either side would be determined. Inland lakes or seas, if such were found, might be gained thus by the most permanent lines of access, while the steps of the traveller would in any case mark out features of primary geographical importance. To insist further on the advantage of carrying an exploratory survey along chains of hills which command distant prospects of the country, and afford the means of angular measurement, when time and means permit, rather than over low plains and through woods, may seem as superfluous as it would be to recommend daylight for a survey rather than darkness; nevertheless, to trace rivers over plains subject to inundation, rather than to explore the more accessible limits of their basins, has been chiefly the practice in exploring Australia, and hence it is that the geography of that large portion of the earth's surface is still involved in obscurity.

The principle of tracing ranges, herein recommended, has been successfully applied to the survey of all the wild and unexplored districts of New South Wales, and its practical utility demonstrated in a map of that colony, engraved in Sydney, and sent by me to the Geographical Society in 1834. A country less favourable for such operations can scarcely be imagined. Intersected by ravines, accessible only to the eagle, the horizon, nevertheless, presents but few points, these being covered with wood. By ascertaining from such stations the direction of ranges connected with them, I was enabled to direct the progress of the surveyors, and thus to measure the basins of streams, whose courses also have been surveyed through valleys which are, even

now, inaccessible to the colonists. Thus, the western sources of the Wollondilly, the northern and western tributaries of the Hawkesbury, the Macdonald, the Colo, and the courses of many other streams, could only be ascertained by tracing the ranges which enclosed them; and such parts of the map as had been until then as blank as that of the interior were thus broken up by the insertion of the principal features of the country. In this case the process which would still be necessary for the survey of a country, after a general knowledge of its features had been obtained, has afforded the best means of acquiring that knowledge; and, in the same manner, by the mere extension of these operations, all Australia may be explored.

In the official account of my journey, in 1831, I stated that the whole country "along the banks of the Karaula, the Gwydir, and Nammoy, bears marks of frequent inundation." The idea of limits seems inseparable from that of inundation, and the rising floods of the Macquarie and Lachlan should have suggested that such rapidly rising waters *had* limits not very remote, rather than that they belonged to a sea of any extent.

We know now that all the waters on the interior side of the coast-range south of 29° are received into one basin, which is subject to occasional inundations, and we know the limits of this basin on one side. The next question naturally arising, is, Where are those limits on the other side? We know that the waters rise suddenly to a considerable height, and we may, therefore, safely conclude, that the width of this basin is not extensive, consequently that some high land bounds it to the north-west. Such an assumption is nevertheless termed "gratuitous" in the remarks on my dispatch, published in the second volume of the Journal of the Geographical Society.

Reverting to the principles which have guided me, as before stated, in my surveys both of the colony and the interior, it may be observed, that although geographical information may not be considered too dear at any price, still, that when lives are to be risked, and all the comforts of civilized life left behind, in order to obtain it, the very best use ought to be made of such knowledge as we already do possess. In illustration of these remarks it may be added, that neither Mr. Oxley in his journey down the rivers Lachlan and Macquarie, nor Captain Sturt in descending the latter river, kept the general direction of ranges sufficiently in view. In exploring the course of any river under common circumstances, and especially the courses of rivers subject to inundation, that bank is preferable which affords the readiest access to high land. The right bank of the Lachlan was, for every reason, preferable to the left: it was immediately adjacent to high land, which lay between two rivers equally the objects of research, and extended

towards the interior much farther than Mr. Oxley ever ascertained. By crossing to the left bank, and losing sight of this range, the consequences were, 1st, That he mistook the Lachlan, on regaining that river at a lower point, for the Macquarie. 2nd, That he missed the "Goobang," an important tributary, and came to the erroneous conclusion that the Lachlan did not receive a single stream throughout its long course; nevertheless, that high ground, properly explored, might have proved the key to all that has since been discovered, and was most accessible during the wettest season. Lest further illustration be necessary to show the advantage of exploring the higher rather than the lower parts of a country, I venture to add Mr. Oxley's concluding description of the region in which, by exploring on the principle recommended, I have since found Australia Felix, a territory in every respect fit for the growth of an additional nation of men. "We had demonstrated," says Mr. Oxley, "beyond a doubt, that no river could fall into the sea between Cape Otway and Spencer's Gulf—at least none deriving its waters from the eastern coast; and that the country south of the parallel of 34°, and W. of the meridian 147° 30′ E., was uninhabitable and useless for all the purposes of civilized men."*

In a similar manner the succeeding traveller proceeded along the right bank of the Macquarie, which, according to these principles, was by no means so promising or favourable as the left. How far the range dividing the Lachlan and Macquarie was associated with any idea of the basin of the latter river, may be learnt from the following definition of one of its northern extremities, "New Year's Range," viz., that it is "the *first* elevation in the interior of Eastern Australia to the westward of Mount Harris."† Had the sources of New Year's Creek or its basin been attended to, it could not have been considered "certain that, unless rain fell in less than three weeks, all communication with the Darling would have been cut off."‡ Neither was there any obvious necessity for contending with the marshes of the Macquarie, when it had been previously ascertained that high land extended into the interior, in a direction parallel to its left bank.

Seasons were opposed, in their greatest extremes, to my operations during my last two journeys: the country, in a direct line to the Darling, and most accessible during a rainy season, was parched with excessive drought; and then, when the party reached the richer soil and better watered country of Australia Felix, the

* Oxley's Journal of two Expeditions, p. 372.
† Sturt's Journal, vol. i., p. 66. ‡ Ibid., vol. i., p. 150.

heavy rains set in, which rendered that soil almost impassable. The aborigines, always most hostile when most numerous, had been united by the droughts at points where collision was unavoidable. These are facts which no man can deny, and they are stated here chiefly in support of the system adopted, which, even under circumstances so adverse, has been attended with useful results.

The present state of Australian geography amounts to a knowledge of all the country east of the Darling; and it is important to consider how this knowledge may be extended with the greatest advantage and least risk of the loss of either the lives or the time of individuals, by generous efforts misapplied.

The leading ranges whose western terminations have been ascertained are the following:—

1. The Grampians of the South, between the Glenelg and the Murray.
2. The range of Mount Granard, between the Lachlan and the Macquarie.
3. The Warrabangle range, between the Macquarie and the Nammoy or Peel.
4. The Lindesay or Hardwick range, between the Peel and the Gwydir.

It will appear, on reference to the map, that in order to intercept the next high land branching westward from the coast ranges, beyond the Gwydir and the Karaula, or Darling, the line of route traced by me in 1831 might be available for this purpose as far as the banks of the Karaula. The trees have been marked throughout that line, and those persons who best understand exploring will, perhaps, appreciate the most, the facilities afforded by a line of marked trees. This was carefully picked out for wheel-carriages, and leading through the region immediately behind the coast-ranges, where grass and water are both abundant, the cattle destined for an interior journey might arrive at that advanced point in good condition.

For the reasons already stated, the primary feature beyond the Karaula appears to be the most important object of research, and would probably afford the most certain line of exploration westward, whether under a superabundance or scarcity of water.

The probability of finding there a range of heights continuous westward is by no means diminished, by what I saw beyond the Darling, where ranges parallel to that river appeared to fall to the south. The sandstone strata of which they consisted, however, did dip to the north-west, even beyond the river, a circumstance certainly rather against the prospect of finding high central land. In this view of the question, it seems not improbable, considering the general course of the Darling, that another river,

parallel thereto, may conduct the waters of the northern portion of the coast range to the vicinity of Streaky Bay on the south coast, where indications of some large fresh-water outlet were noticed both by Baudin and Flinders. Were this prospect more certain, such a river might, indeed, be intercepted by exploring from beyond Fort Bourke; but from what I learnt from the natives in the interior, the first great river beyond the Darling is visited by natives from the Macquarie, *by proceeding northward.* I found, that contrary to the opinions entertained by some, of their limited knowledge, the aborigines of some parts are in the habit of setting out, occasionally, on distant expeditions, in order to surprise and carry off females; and that such predatory excursions sometimes extend from the Macquarie to far beyond the Karaula, where they reach the banks of a *river larger than the Murray*, named by them the "*Wallaspleyn.*" It is not improbable that the bushranger's story had been founded on reports, which he might have heard amongst the natives, of the existence of such a river. At all events, the waters from the northern coast range must flow somewhere, and the most certain line of exploration for the solution of this question appears to be in prolongation of that marked by me in 1831 to the banks of the Karaula.

The difficulties which attend travelling in the interior of Australia arise chiefly from—1st, The necessity for carrying all provisions, tents, bedding, &c. required; 2nd, The scarcity of water; and, 3rd, The mischievous disposition of the savage tribes.

A stock of provisions calculated to last several months burthens the traveller with a load, which is sometimes very inconvenient when rivers or rugged ranges are to be crossed. This impediment we were enabled to diminish very much on the last journey, by taking live sheep instead of salted meat; and we found that after a little time the sheep required but little care, and that they even fattened on the journey.

The difficulty of finding water may be, in a great degree, avoided, by awaiting a proper time for setting out on journeys to the interior. This would be when saturating rains had fallen, and filled the hollows of the surface; after which water may be found, even on the plains, where certain inequalities on a surface of clay may retain it for several months. Seasons of flood or of drought are so extremely irregular in Australia, that some caution is necessary as to the period of setting out. Extremes of many years duration were obvious in the interior, where the growth of trees, full six inches in diameter, in the beds of lagoons, had not been interrupted, until the influx of water, by some change of season, had at length killed them; such dead trees having been seen also

standing as they had grown, in the very channels of streams. On the other hand, the long duration of excessive floods was evinced by the large fresh-water muscles of the *unio* genus, and weighing as much as three ounces and a half, which were seen projecting where they had grown, in a surface which had once been mud, but which, when crossed by the drays of the expedition, was covered with the turf of two years' grass.

When water happens to be generally distributed over the surface, the difficulties arising from the third source; which certainly is not the least impediment to the survey of these regions, viz., the savage disposition of the natives, are not so much to be apprehended. To approach *suddenly* a single strange native is at all times dangerous, for he will at all hazards attack the stranger. Several instances of this occurred in Mr. Oxley's journeys, and strangers of the aboriginal race are equally liable to such danger, and are particularly cautious in their approach, especially wherever water is to be found. Besides the above-mentioned danger, apparently the consequence of desperate fear, a lurking desire to take the lives of intruders, and by the most treacherous means, seems to be but too generally characteristic of these aborigines, especially when they have never before seen white men. The murder of two on the first expedition, and of Mr. Cunningham on the second, are instances of this; and the same unfortunate propensity has been still more recently made manifest by the dreadful fate of Captain Frazer and his shipwrecked people. No demonstrations of kindness, nor gifts presented, will deter these savages from making attempts to approach a camp at night for such bloody purposes, if they see they can do so without danger. Good watch-dogs afford some security. Others have been unfortunately obliged to fire upon them in the dark;* but we avoided the painful necessity for doing this, and anticipated such night attacks by a sudden display of rockets and blue lights, which had the effect of dispersing any parties known to be so approaching under cover of night; while the sudden and ridiculous bustle of men dressed in masks of animals' faces glaring with liquid phosphorus, firing in the air, and shouting, to the no small consternation of the savages, afforded considerable amusement during dreary winter nights, in such solitudes, to the men of the party.

Those natives who accompanied the expedition deserved the highest praise; they were intelligent, faithful, devotedly attached to the leader thereof, and extremely useful. However difficult it may be to conciliate the aborigines on the first approach of men of a race so different from themselves, and of whose *power*, and of whose *purpose*, they are quite ignorant, it

* Sturt's Two Expeditions, vol. ii. pp. 208 and 211.

is not less pleasing to observe, than it must be gratifying to the philanthropist to learn, that when they are once made acquainted with both, and have also become sensible of the universal protection afforded by British humanity and British laws, they undergo so great a moral alteration, that too much pains cannot be taken to bring about so desirable a change, or to protect those children of the soil from the acts of violence and injustice to which they may be exposed in the midst of a convict population.

XXII.—*Diary of an Ascent of the River Corentyn in British Guayana, in October,* 1836. By Robert H. Schomburgk, Esq., Corr. Mem. R. G. S. *Read* February 13th, 1837.

Having, during the season of 1835-6, explored the river Essequibo into 3¼° N., and the river Rupununy into 2½° north latitude, it seemed desirable to make choice of some other of the great rivers of Guayana; with the hope that by pursuing the stream towards its source, we might be enabled to penetrate into the interior towards the Sierra Acaray; and also might at the same time investigate the capabilities of the adjacent country for supplying the demands of an increasing colony. In accordance, therefore, with a plan laid before his Excellency Sir J. Carmichael Smyth, the river Corentyn was selected for this purpose. The little knowledge which the colonists had of this river, and the reports of those who had visited its lower regions occasionally, and painted its fitness for colonization in very favourable colours, made a further examination appear necessary. In order to be able to dedicate my attention uninterruptedly to the chief object of the expedition, I engaged Mr. Vieth as ornithologist, and Mr. Heraut, who accompanied me during my former expedition, as draughtsman; in addition to which Lieutenant Losack, of the 69th Regiment, and Messrs. Cameron and Reiss, offered to accompany me as volunteers.

September 2, 1836. We quitted Demerara for Berbice: so little is the navigation of the Corentyn known, that I found it impossible to get a conveyance direct for that river. I was therefore obliged to charter a schooner in Berbice to convey us to Plantation Skeldon, on the western bank of the river Corentyn, where we arrived on the 9th September, and were received with every kindness and hospitality by the proprietor, Mr. Ross. According to the arrangements I had made with the Post-holder, Mr. de Wolff, I expected to find a sufficient number of Indians at the plantation Mary's-hope to convey me to the Post. Mary's-

hope is situated at the mouth of the river; and as I was anxious to determine its geographical position, I proceeded thither next morning, and found, to my regret, only a few Indians, and by no means sufficient to man the corials, which consequently delayed me some days, during which I determined its position to be in latitude 6° 2′ 15″ N., and longitude 57° 1′ 47″ W.

September 19. Pursuing our way up the first or sea reach of the river Corentyn for about forty miles, with an average width of one mile, we arrived at the Post of Oreála. The banks of the river thus far are generally low, but very fertile, and well calculated for the cultivation of the staple commodities. At present they are almost uninhabited; with the exception of two woodcutting establishments on the British side of the river, no inhabitants are to be traced from Plantation Skeldon to within a few miles of the Post. Whole tracts of the most fertile land are left uncultivated, and are the undisputed haunt of the jaguar and the fleet deer. It is not only the fertility of the soil that recommends this tract for cultivation, but the easy communication which might be established between the rivers Corentyn and Canje, an affluent of the Berbice, deserves consideration.

The course of the river is almost due south in ascending, until, in the vicinity of the Post, it takes a somewhat eastern bend: here the soil changes, and a range of low hills, about fifty feet high, and from their white appearance called chalk hills, are observed on the river's western bank. On one of these hillocks is at present the site of the Post, where we intended to sojourn for a few days, to procure a crew sufficiently strong for manning our corials. I found great difficulty in effecting this; sickness prevailed to an alarming degree in the Indian settlements, and a general dislike was shown to venture on such an undertaking as the ascent of the Upper Corentyn, which, according to their superstition, is believed to be inhabited by evil spirits, besides the apprehension of coming in contact with the Caribs, a nation dreaded by every other tribe. Many an artifice was therefore necessary to induce them to join us.

There are several settlements of Indians here under the care of the Post-holder: the number of individuals may be 650, viz. Arawaaks, 300°; Warrows, 250; Caribs, 90. Like the generality of the Indians they cultivate provisions, and live by hunting and fishing, while the chief part of their time is spent in the hammock. It is only lately they have commenced assisting woodcutters to fell timber, or to split staves, for which they receive monthly wages, or a stipulated sum for a certain quantity of staves, or squared timber. It is a pity that the credulous Indian should be imposed upon by many of the unconscientious wood-

cutters, who undervalue his work, or pay him in articles with an enormous profit. If he discover hereafter that he has been deceived, his natural indolence will find a ready excuse for returning to the hammock, and more injury will be done to the cause of civilization than can be remedied by the friends and promoters of so desirable an object. Ought not the Indian to be guarded against the imposition of the colonists?

The situation of the Post is in latitude 5° 16′ 38″ N., and longitude 56° 53′ 31″ W. by chronometer. In examining the hills called by the Arawaaks Oreála, by the Warrows Alivavara, I descended by a hollow which had been formed by freshes; and after having gained the river, I had a view of a section of the formation. It was composed of horizontal beds of a siliceous conglomerate, intermixed with red sandstone, with small grains of slightly-rounded quartz, a calcareous* and often schistose bluish clay, beds of loose sand, and of a substance resembling shale. The unctuous and blue schistose clays however predominate. I did not discover any organic remains. These cliffs stretch north and south for about three miles. In their rear extend Savannahs for a considerable distance; they are clothed with short grass, but the soil is not fertile, and soon exhausted.

Immediately opposite Oreála, on the eastern shore, is *Semira*, the site of a former Moravian mission, and ten miles higher up, on the western bank, is the deserted site of another establishment of these persevering and truly Christian men.

September 21, 22. While here the autumnal equinox occurred, and I took a set of hourly meteorological observations † for forty-eight hours. The situation of the barometer was about one hundred feet above the sea.

September 25. Having completed our arrangements, we quitted Oreála. While stopping at Mr. Layfield's, in latitude 5° 15′ N., I measured a base line to determine the width of the river, and found it to be at high-water mark 1230 yards, the average rise of the tide 6 feet; the velocity of the current increased by the ebb tide about three miles an hour; the temperature of the water was 82°.5 Fahr. One mile east of Mr. Layfield's are two islands, the smaller called Bunjabanabú, the larger Killikagro. From the eastern end of the latter extends a considerable sand-bank towards the western bank of the river; but on the eastern shore is a channel deep enough for vessels of fifty tons. While approaching *Asirikani* or Long Island, a sudden rise of the water or *bore* of three feet high occurred, and dashed

* Lime is very rare in Guayana. Dr. Hancock observes that he never met with anything that would effervesce with an acid on the Essequibo, Parme, or Orinoko.

† Preserved for reference in the library of the Society.

violently against the shore; this was repeated three times; it usually takes place at the first setting in of the flood-tide, and is highest at the equinoxes. The natives call it Abapúri.* The river, although here are two islands, is by no means narrowed in; but half a mile further north it takes a sudden bend, which may help to cause the rapid rise of the young tide.

We observed the Abapúri at 4h. 45m. P.M. off Asirikani, when, according to calculation, the flood-tide must have set in at the mouth of the Corentyn at 11h. 50m. A.M. If the rise of the wave was therefore the indication of the young flood, the tide wave travels in five hours a distance of sixty miles by the windings of the river. I did not hear that the Corentyn below Asirikani offers a similar phenomenon, but a bore of five feet rise is said to occur opposite the Indian settlement *Wasiappo*, fourteen miles higher up the river. We reached before nightfall the second range of clay hills, called by the Indians *Sipruta*. They are of less height than the former, and their formation made me almost suppose, when on my return from the cataracts I examined them more closely, that they might contain coal. Other features strengthened me in my supposition; and as I do not doubt that this geological feature extends to Berbice, its formation there may be more developed, and indicate a discovery which might be of great benefit to the colony. The composition of the beds consisting in alternating substances, as clay, shale, and sand, as described before, is analogous to the coal measures of Poland; and scattered portions of a bituminous substance, which I found on sandbanks in the river, first drew my attention to the fact. Hereafter I hope more fully to investigate the subject. At Siprúta the river is somewhat hemmed in by the hillocks, and takes a north-eastern, and afterwards southern and south-western course,† describing almost a circle; a due south course across the land leads from Siprúta in three quarters of an hour to Paerurú, the opposite point, while six hours are required to follow the river's winding course. The luxuriant vegetation of the river appeared to increase the further we advanced. I readily recognised all the useful timber-trees for which Guayana is so much famed. The soil is equal, if not superior, to that of the Essequibo, and rests upon a clayey substratum. The banks in the vicinity of Paerurú consist of ochrous clay. The river now takes a decided western

* This bore is observed in several rivers in Guayana, as well as elsewhere, which are funnel-shaped. The different tribes on the coast, we learn from Dr. Hancock, usually give it some name, signifying *head of waters*, or *mother of waters*; and in connexion with this have many strange stories to tell of the *Luku-qui-yaha*, mermaid, or "watery mamma," as they translate it.—ED.

† It must be understood that these courses have reference to tracing the river upwards towards its source.

course: rather more than two miles west of Paerurú is the brook Epira, inhabited by many Arawaak Indians. We visited them on our return, but were obliged to wade through swamps and to cross the brook several times before we reached their settlement. The Manicole palm is almost the only tree which delights in the boggy soil, which extends between the river and the settlement. Their huts are built upon sandy hillocks, not more than twenty feet high, which extend in a south-western direction. I consider them a spur of those at Kayiwa. The number of Indians that live here may amount to 150; and by paths across the Savannahs they keep up a regular intercourse with those at the Post of Oreála. At the first Carib settlement, called *Kayiwa*, (or hard sand,) where we resolved to stay until the turn of the tide, we found that high water was at 11h. 5m. Consequently, at 10h. 39m., at full and change, and 5 hours later than at the mouth of the river, distant seventy miles, the rise amounted to somewhat more than thirty inches. The settlement is on a sand-hill, about 100 feet high, close to the river, and is in latitude 5° 4′ 10″ N. These hillocks extend farther inland, in a south-western direction. About a mile from Kayiwa we saw another cliff, about fifty feet high, where clay and bog earth were the most prevailing substances. The clay is of the finest quality, and resembles pipe-clay. The Indians have a tradition that they are inhabited by a large snake, which from time to time goes to drink the water of the Corentyn, and its passage thither has deprived the cliffs of vegetation. At the south-eastern base of these hills the river, after a course due east for 40 miles, (tracing it down-wards) turns abruptly to the N.W., and pursues a very meander-ing course for 30 miles to the northward, forming bends about 6 miles in diameter. The banks of the river, as we ascend, assume their usual height of about twelve feet. The rivulet Matappie joins at this angle from the eastward. It is said to be connected with the river Copename, and by it the Maroon Negroes keep up a communication between the latter river and the Co-rentyn. Thirteen miles beyond, in the parallel of 5° N., we first observed sandstone rocks *in situ*, and shortly passed several rocky islets. On the right or south shore joined the river *Cabulaba*, which I ascended for a few days as far as it was navigable. This river, which is about 100 yards wide at its mouth, exhibited all the luxuriance of a rich soil; numerous shrubs of the wild Ar-notto margined its banks, and the splendid flowers of the *Cassia Calyantha* towered over them. The river is very winding, and is considerably wider at six miles distance from its mouth: the water is of the colour of ochre, and apparently muddy, as the Corentyn, though, when put into a glass, it is clear. The average

depth is twelve feet. I have generally found the water of these two streams to be from 5° to 10° of Fahrenheit higher temperature than the air. The Cabalaba reminded me much of the Upper Rupununy, from the colour of the water, its numerous short bends, its sandy spits, and its similar fish, including the sting-ray. Hills sixty feet high occur about twelve miles from its mouth, and erratic blocks become frequent; occasionally a rocky islet, and its usual companion the Aromatic Guava growing luxuriantly upon it. Numerous Sacki Winkis (*Hapale* Spec.?) jumped with agility from branch to branch. The water-hare, a species of cavia, appeared likewise frequently on the banks, and plunged into the river as soon as it espied us. The sound of falling water attracted our attention, and discovering the mouth of a tributary stream to the S.E., we forced our way through the branches which almost hid the entrance, and discovered a cascade about twenty feet in height, called by the Indians *Itáfe*. The rocks are of sandstone, in which I found vestiges of feldspar. I was astonished to find a number of blocks of a fine-grained whitish sandstone, which I could not trace to the parent rock. They are used by the Indians as grindstones, and are of excellent quality, and well worth the trouble of procuring by the colonists.

We slept this night on a sandy spit, and while occupied in constructing our tents we heard a report of a gun to the eastward, which our Indians ascribed to the Maroon Negroes, a signal which the outposts generally adopt to inform the camps of the presence of strangers. The Indians told us that these Maroons frequently visit the Cabalaba on fishing expeditions: indeed, by means of this stream and its tributaries, as well as those of the rivers Copename and Saramaca, they are said to keep up constant communications with the Corentyn. In order to show that we were equally on the alert, we fired a small cannon, and we were not a little astonished when Mr. Vieth, who had remained with the rest of our party at Tomatai, eleven miles distant, told us on our return that the report of our gun had been heard at that settlement.

Oct. 4. We started this morning early in order to reach the cascade of *Avanavero*, the aim of our present excursion. The morning was misty, and we could scarcely see more than twenty yards before us. The thermometer stood at 77° Fahr. at six o'clock, while the water had a temperature of 82°. We passed numerous rocky islets stratified, the strata dipping 65° to the south, and apparently of trappean formation. No where had I seen the black crust of oxide of manganese in such thick layers upon the rocks as here. Sandy spits projecting into the river are always the first indication of approaching rocks and islets. It is on

these sandy points that the deposits called *pegas* are formed of half-decayed vegetable mould from leaves and grass which are swept from the land during the annual inundation.

Two miles further, a chain of hills, about 200 feet high, stretches east and west, through which the river has forced itself a passage, and is turned at an acute angle from its north-west to an east direction. These hills consist of granitic boulders piled upon each other, their interstices being filled with soil. A luxuriant vegetation and fine timber-trees now cover these granitic heaps. At their base rushes the Cabalaba over a rocky barrier, forming the cascade of Avanavero, about twenty-five feet in height. The tract of granite is barely a mile in width, above which the river flows again uninterruptedly, its breadth being about 200 yards. According to observation which I took on the sandy spit the night previous, Avanavero is in lat. 4° 47′ N. and long. 57° 13′ W.

On our return to Tomatai every possible hindrance was resorted to to prevent our departure. The difficulty with which luggage can be conveyed had obliged me to curtail the stock of provisions, expecting that the Indians would furnish me with casada bread. Before I left Tomatai, on our excursion to Cabalaba, they had given me their promise to have a large quantity ready on my return. They advanced numerous excuses for not having complied with their promise, and desired me to wait three days longer, at the expiration of which eight or ten cakes were brought, a quantity which was not sufficient for one day's sustenance, and neither threats nor promises could induce them to sell us more. Those whom the post-holder had engaged to accompany me in my expedition did not refuse to do so, but the provisions they took with them were by no means sufficient for a lengthened period. Towards the other Indians the Caribs were overbearing, and refused them any of the provision which they had in superfluity. This may have been the reason that four of my Arawaak crew took a corial and ran away, and consequently I was the more obliged to depend upon our uncivilized Caribs. Their number is by no means great: the settlement Kayiwa, on the British side, does not muster beyond thirty men, women and children included, while the population of the three settlements, Tomatai, Pacuima, and Maijari, on the Dutch side, may amount to 100 persons; many of these belong to the mixed race, the descendants of a Carib father and an African mother; they keep up a constant intercourse with the Caribs on the rivers Copename and Wayomba. The old maps represent generally a connexion between the rivers Corentyn and Nickierie by the river Maratica. I was not able to get the slightest information on the subject, but as the

Caribs who purpose visiting the settlements on the Corentyn always use that river as the high road, it is to be presumed that they are not acquainted with any other, or they would have chosen the shortest. We found at Tomatai three Macúsie women, kept in bondage by the Caribs. Only a short time ago one had attempted to make her escape, but was recaptured: what her fate was I could not ascertain, but I was told that she had been sent to Copename. This nefarious trade is, therefore, still carried on; and from several observations which fell from the Caribs, we suspected that a new expedition to the Macúsies was in contemplation; and further circumstances, as will be seen in the sequel, proved that our suspicions had been too well founded.

Tomatai is in 4° 59½′ N. and 57° 16′ W.

Oct. 11.—I was rather surprised to find that three corials with Caribs, which were entirely unattached to my expedition, followed us, though at first keeping behind; the next day they joined us. I saw clearly through their policy: the Caribs were thus by far the more numerous party, and while I could not prevent it, I adopted every precaution to render any bad intentions from their side harmless: our corials were chained and locked every night, and my own, manned with Warrows, kept always in the rear when under way: our whole party, thus increased by unwelcome guests, amounted to fifty-eight persons. As we ascended, the Corentyn still came from the west for about twelve miles. Above Tomatai the river is studded with rocks; some hills about 150 feet high occur on the northern bank. I consider them an offset of the Twasinkie* mountains which I passed in 1835, on the river Essequibo, in about the same parallel; their geological character was similar. A small stream, called *Assiprua,* here falls in from the northward. South of the island *Alapalissa,* the rocks assumed a north and south direction, and in their gigantic forms resembled much those of Accra Moucra on the Essequibo. The banks of the river in the vicinity of *Alavarlae* island are ten to twelve feet high, and consist of a species of clay which the Indians call alina or acurú; they use it for the manufacture of pottery. The substratum was an ochrous clay, covered with rich mould, in which trees and plants appeared to thrive luxuriantly. The wild cotton which I found here is of a superior texture, and the samples which I carried with me to the coast were much admired. We experienced on the night of the 11th a severe thunder storm; the rain descended in torrents with the noise of a cataract, and I found that the rain fallen in eleven hours amounted to the enormous quantity of 5.7 inches. We encountered next morning the first

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* See Journal R. G. S., vol. vi. p. 231.

rapid of consequence in the vicinity of the island *Bacacai*, about seventy miles direct distance from the sea. After we had passed the island, our course lay towards high ground, but before we reached it, the river presented another of those scenes of confusion which are met with so frequently in the rivers of Guayana; many of the boulders were forty feet high, and a large decayed trunk which the current, during the inundation, had swept across two or three boulders, where it might have served in lieu of a bridge, proved that the Corentyn, in that place, is, during the rainy season, at least twenty feet above its present level. The nearer we approached the hills we had seen in the distance, the stronger we found the current, narrowed in by the hills, which we estimated 120 feet high: a slight bend of the river increases the velocity, and almost an hour elapsed before we could overcome its influence: the current ran at the rate of four or five knots. We stopped for breakfast at the foot of the hills, which had a north-west and south-east direction. The rocks appeared to be obscurely stratified, and were highly ferruginous. It is this barrier of hills that turns the river's course from the south, and causes it to flow east for about forty miles; a very striking feature in the course of this river, no trace of which appears on any of our maps hitherto; in fact, the upper part of the Corentyn, for the next fifty miles, flows on a meridian to the *westward* of a great portion of the river Berbice, whereas the former falls into the sea more than twenty miles to the *eastward* of the latter. I was told by some of the Caribs, that from here a path leads alternately over savannah and woodlands to the river Berbice, which they reached in a day and a half, easy walking. We passed many islands, where spots of whitish sand extended into the river, and which during our ascent we selected for our night's encampment. The sand, heated during the day, keeps up a high temperature long after the sun sets: at eight in the evening the air was generally 77°, the thermometer, placed in the sand, rose to 85° 3. I have frequently repeated this experiment, and found always a difference of from 5° to 8° Fahr.: this difference amounted in the afternoon often to 40°; and while at Tomatai, I observed that the white sand at three P. M. had a temperature of 128°, when the atmosphere was only 85°. On a point where the river was hemmed in on one side by numerous boulders of sandstone, on the other by a sandbank, we halted to examine the nature of the rocks: they were of the same description as those I had seen at Itaffé and in the Cabalaba, and in consequence of their close structure and fine grain peculiarly qualified for grindstones. The boulders are often ten to twelve feet high, and sometimes as much in girth. If hereafter building stones should be wanted, this tract will afford abundant materials. These rocks are in lat. 4° 43′ long. 57° 40′, at nearly

the most western point of the Corentyn, as far as I have had an opportunity of visiting it.*

Oct. 14.—Our progress was next day quite slow in a S.S.E. direction. Rocks and islands were so numerous that our scout had often to visit several passages before we could venture to attempt one with our corials. These gigantic boulders are a most remarkable feature, and though they astonished me while ascending the Essequibo, they are in the Corentyn more numerous and not less in height and size. Only a few are angular, the most of them being spheroids, or dome-shaped; all are more or less coated with the metallic lustre, which is said to arise from a coating of oxide of manganese. Where we found several smaller blocks accumulated, the place between each was filled up with that strange vitreous matter already noticed while ascending the Essequibo, which I am much inclined to consider as having been under fusion. The scene is here very interesting; the chaos of rocks, the rushing of the waters, the numerous islands which cause the river to spread upwards of one mile in breadth, each has its particular attraction; but the most striking feature was, I might say, a forest of *lacis*. Those beautiful aquatic plants were in full blossom; the light brownish scape, the thickly set flowers, naked, and of lilac colour, formed a strong contrast to the otherwise barren granitic rocks. Thousands were in flower, and their luxuriance showed how much they were delighted with the spot. I measured one of the lanceolate leaves, which I found three feet two inches long and two feet wide. Our camp was selected at a rocky islet, called by the Caribs *Akalikatabo,* in lat. 4° 40½′ N. 57° 39′ W.

Oct. 15.—We passed next morning a remarkable rock, called by the Caribs *Timehri.* It is not only distinguished for its size, but there are a number of gigantic figures engraved on it, one of which measures more than ten feet.† The river continues studded with rocks and islands, winding in a S.E. direction for ten miles, when it narrows to its former width, and flows directly from the S. for nearly fifteen miles.

Oct. 17.—After we had passed a turn which the river makes, we observed several hills on both sides: half an hour's further progress, and we found ourselves in apparently a large basin, sur-

* And from subsequent information respecting the course of the Berbice, it appears that the direct distance from the Corentyn to that river, at this point, is not nine miles, being their nearest point of approach.—Ed.

† Drawings and a particular description of these figures, I shall have much pleasure to forward to the Society on my return from the second expedition.

[They have not yet arrived.]—This is, we believe, the most eastern spot in this part of South America in which these remarkable sculptured rocks have been hitherto seen: from M. de Humboldt we learn that similar figures exist near *Caycara* in lat. 7½° N., long. 66½° W., and here Mr. Schomburgk finds them in lat. 4½° N., long. 57½°, at a distance of nearly 600 miles.—Ed.

rounded by hills, from sixty to one hundred feet high. The river was now broken up into torrents, the white flakes of foam which came sailing down as if to give us a welcome, the thundering noise of falling waters, and a cloud of mist which hung over the southern hills, all spoke in an intelligible voice that some great scene of nature was before us. It was evident that we should have to make a stay here, and I gave the necessary orders for erecting our tents: while thus occupied, the Caribs told us that we should find it impossible to get on farther; and though it was true that there was a path existing, it was only passable during the rainy season, when the river's bed was full, and the impediments much less. It struck me as peculiar that I heard for the first time of the impracticability of passing the falls before us: the hints that had been thrown out for the last two days had not specified in what the difficulties consisted, and as I had been frequently threatened in a similar way during my former expedition, and had safely passed them by perseverance, I entertained the same hopes at present.

Oct. 18.—This morning we reconnoitred the ground, and after the corial had been hauled over a bed of rocks, we crossed a rapid in an oblique direction, and soon stood before a pile of rocks, which when the river is full are the bed of a cataract; at present only a small stream rippled over their blackened surface. It had appeared to me from our encampment as if this place would have afforded me the possibility of drawing the corials over, but my hopes fell with every step that I advanced, enormous piles of rocks grouped together opposed obstacles even to our farther progress on foot: at times we saw chasms at our feet, and a courageous leap was necessary to cross them, or we had to wade through a stream which pushed its winding way through rocks, and disappeared as if by magic, until the subterraneous noise told us that it was rolling below our feet, and made its re-appearance where we least expected it, and were wondering from whence it came. Some of the rocks are in shelves; many exhibit circular holes partly filled with quartz pebbles. I measured one of the larger cavities and found it three feet deep and ten inches in diameter. Many of the rocks were clothed with numerous plants; a species of orchidea and an agave were the most remarkable among them; clusters of bright yellow flowers distinguished the first, while the long and slender scape of the latter, adorned with thousands of flowers, gave a picture of luxuriance even to the sterile rock. On our right we heard the thundering noise of a cataract, over which a dense cloud of mist was hovering: thousands of swallows were skipping through this cloud, rising and falling as if delighted with the constant moisture arising from the spray.

We visited the cataract afterwards, which in grandeur surpassed

any I had before seen in Guayana: the velocity with which the mass of water precipitates itself over the ledge of rocks to a depth of upwards of thirty feet perpendicular, causes the spray to form the cloud we had observed, before the cause of it was known to us.

Previous to my visit to this, which is the most western of the falls, I had followed a party of Indians, and after some labour and wading, reached a branch of the river, which divided itself in two channels; the western formed a fall, and the opening prospect on my arrival at its head was beautiful indeed; the water rushed at an angle of sixty degrees into a valley formed by gigantic piles of rocks, which we had taken the previous day for hillocks, in which belief we had been strengthened by seeing them covered with large trees; at our feet foamed the disturbed water, dashing its spray against the rocks that impeded its course; but the most splendid object was a cascade on the opposite side of the chasm: the rocks over which the water fell were clothed with a lacis, the pendulous branches of which were often five and six feet long, and the whole resembled a rich carpet: the various tints of green, the strong contrast of its flowers, and the foam of the water which rushed over it, made the scene exceedingly beautiful: we estimated the height of the fall twenty-five feet, and that on the top of which I stood at thirty feet: they are almost opposite each other; but the commotion of the waters where they met made me suppose that there was a third, which was hid from my view by an intervening island. I was for some time at a loss how to get there, but by great circuits and dint of wading, I succeeded at last, and I was richly rewarded. Three channels of the river unite at the head of the cataract, and at their junction their farther progress is obstructed by huge blocks of granite, through which they have forced a passage, and are thence precipitated headlong into a chasm full forty feet below. A large rock stands out in relief, and has been fancifully said to resemble a thigh-bone. The most western cataract is on a grander scale than the two others already described, but what they want in grandeur is fully compensated by the lovely prospect they afford, when viewed from the foot of the valley. The Indian name of this series of cataracts is *Mavari Wonotopo*. The former, or western fall, we named after General Sir Carmichael Smyth: on the latter we bestowed the name of Sir John Barrow, as President of the Geographical Society. There is a third cascade farther to the east, and which, under any other circumstances, we might have considered grand; on the rocks on the western shore here are more of the Indian hieroglyphics. The river above the cataracts is divided into numerous channels, which unite and form in one breadth the three series of falls just named.

Much as we had been delighted with the romantic scenery that

we witnessed at the cataracts, the circumstance that it appeared to us impossible to cross the rocks in our corials lessened in a great measure our enjoyment; nevertheless, the hope remained that there might be a path by which they could be avoided. I summoned the Caribs who composed part of my crew, and which I had selected as guides, as they were the only nation acquainted with the upper Corentyn, and questioned them closely on a subject so important to our farther progress, but to no purpose: they did not deny that they passed these impediments during the rainy season, in order to cross by a path, which was two days' journey above the cataract, over to the Essequibo; but that at present we could not pass. In order to serve as a stimulus for exertions, I now offered a reward to any Indian who should discover a place where we might be able to cut a path for the transport of boats and luggage, and a still higher reward was held out to the coloured people who made part of my crew. In consequence of this, expeditions were undertaken every day; but the more I examined the ground, the more I was persuaded that it was impossible to construct a path, with willing hands, in a shorter period than from six to eight weeks; and that our Indians were not willing, we had now daily proofs: the Caribs, by far the most numerous of my crew, who from the commencement behaved in a manner which I could not explain, now threatened to depart: they demanded to receive provisions like the other Indians, though their cassava fields, had they been willing, would have afforded us sustenance for six months, and as policy directed me not to quarrel with them, I was obliged to give them allowances in rice and other provisions; and the inroad which was consequently made in my stores caused a well-founded apprehension that even if I dismissed the Caribs my provisions would have failed in less than three weeks. My companions urged, therefore, my return; and as the perilous situation we were placed in was evident, I consented with a heavy heart: at a long consultation we had on the subject, I expressed the hope that the ascent of the river Berbice, which is more inhabited by friendly Indians, might lead us perhaps to the accomplishment of our design of crossing the impediment of the cataracts, and of penetrating to the chain of mountains in the second parallel of latitude. I occupied myself the following days with surveying the lower basin, and in extending the operations to that point where the river meets the first impediments. The result of this survey, in which the distance was measured by sound, was that this tract of rocks extends about five miles and a half north and south, and is probably connected with the range of boulders in the Essequibo, about this parallel. Through the whole defile, rapid, or rather fall, followed upon fall, and we had at one time four cascades in view following each other in succession. Shortly

after twelve o'clock we reached the point where the river, with a breadth of 900 yards, flowed smooth and uninterruptedly. I here placed Englefield's barometer, and found this spot 100 feet above our encampment, which I had previously ascertained to be 430 feet above the level of the sea. The fruits of my prolonged survey were not only a knowledge of the country above the cataracts, but likewise the discovery of several new orchidea and some cacti, which I had not before seen, as also the knowledge of the extensive tract of boulders, the geological details of which I reserve for another opportunity. The means of several observations gave me, as position of our encampment, 4° 21½′ N., 57° 35½′ W.*

Oct. 23.—This morning we unwillingly set out on our descent of the river. On our arrival at Tomatai, the Carib settlement, most of the Caribs absented themselves, and only a few with their chief, Smith, accompanied us to the post of Oreála. Shortly after our arrival, a large corial (about forty feet long), with Caribs from the river Wayombo, landed there, and exhibited a pass from the authorities at Nickierie, a Dutch settlement at the mouth of the Corentyn. We heard, to our great astonishment, that they purposed ascending the river, in order to cross over by land to the Essequibo, and thence to proceed to the Macúsie country, with the intention of trading for slaves: they openly asserted that this was their object, and showed us guns and other articles of trade for that purpose; but they likewise assured us that the Caribs of the Corentyn were to accompany them, and that the chief, Smith, had been for that purpose a few months ago at their settlement, in order to arrange matters. Our suspicions were thus verified, and the behaviour of the Caribs fully explained: under the idea that we were bound in the same direction, they had supposed that our presence would interfere with their design, and every deceit was used to prevent our crossing the cataracts. We discovered likewise that they had withheld from us the knowledge of a path where, by means of a creek, the falls might have been passed, and that even large corials might have been transported to the point of re-embarkation. After consulting whether we should return to the cataracts and force them to show us the passage, it became evident that now, more than ever, they would use every means to prevent our executing this design, and being so near the coast, I adhered to my former plan to ascend the Berbice, and thus another river of British Guayana would be explored, and our ultimate object of penetrating to the Sierra Accaray might be rendered easier.

Though the expedition up the Corentyn failed in accomplishing

* This series of cascades is about fifteen miles direct distance from the river Berbice, and within thirty miles of the Essequibo, at the point called the Rapids of Rappoo.—See Journal R. G. S., vol. vi., p. 236.—ED.

this great object, yet the knowledge acquired of this river—the fitness of its banks for colonization—the peculiar mineralogical formation in its vicinity—and the discovery of the possibility of Guayana possessing coal measures, are of some importance. The river, represented in all former maps as one of inferior size, I have found almost equal to the Essequibo, and its course as laid down in them from lat. 5° N., is ascertained to be the reverse of the truth; and where it is in them represented to have its sources, it is found 900 yards wide. Indeed, every circumstance considered, I come to the conclusion, that the three chief rivers of British Guayana probably have their sources in the same chain of mountains, within a short distance of each other, or possibly, they flow from a lake, of the existence of which I received new information from the Indians. Their report, however, is too vague and contradictory to deserve much confidence.

[In consequence of the unfavourable state of the weather in the month of September, 1836, when Mr. Schomburgk was at the mouth of the Corentyn, he was not able to effect a survey of the entrance of that river; yet being fully aware of the importance of such a survey to the mercantile interest of the colony, on his return from the expedition up the river Berbice, Mr. Schomburgk chartered a small schooner, and proceeded to the mouth of the Corentyn in June, 1837, and, overcoming many difficulties that were thrown in his way, he succeeded in surveying the entrance. As the result of this survey, Mr. Schomburgk has sent home a chart, on the scale of one inch and a quarter to a nautical mile, showing the positions of the chief points, the depth of water, the form of the mud-banks, the rise and set of the tides, &c. &c., both at the entrance of the Corentyn, and of its eastern affluent the Nickierie. The detailed account of the survey has not yet reached England; but from the chart, and some slight notices contained in Mr. Schomburgk's letter, we gather the following *data*, which are a valuable contribution to the hydrography of that coast, and may be useful to our commercial interests:—

	Lat. North.	Long. West.
Mary's Hope, at western entrance of the Corentyn (Plantation No. 49)	6° 2½′	57° 2′
Plantation Skeldon, on western bank	5° 52′	57° 0′
Gordon Point, on eastern bank	6° 1½′	56° 46′
R. Nickierie, on eastern bank (Battery)	5° 57½′	56° 52½′
Parrot, or First Island—north end	5° 52½′	56° 56½′
——————— south end	5° 44½′	56° 59′

The extreme width of entrance of the river, measured in a N.W. and S.E. line from Mary's Hope to Point Nickierie, and just within the mud-flat extending from the western shore, is ten miles.

Five miles within this line the river suddenly contracts, in the parallel of 5° 55', where, from *Anamormisi* Creek on the west, to Bluff Point on the east, it is only four miles; and it retains this breadth, nearly in a south by west direction, for fifteen miles, as far as lat. 5° 40', when it narrows to three miles, and bends to the S.S.E., as related in the account of the Ascent of the Corentyn.

Three miles to the southward of Point Bluff commences *Coruo-oboro*, or Parrot, or First Island, about seven miles long from north to south, with an average width of one mile, and lying on the eastern or Dutch side of the river, between which and the island is a general depth of nine feet at low water, with a channel three cables wide.

Sailing-directions for the Entrance of the River Corentyn.

The whole of the coast about the entrance of the river is low and wooded, with occasionally a sandy beach. On the western side, three miles to the northward of the Plantation Mary's Hope, or in lat. 6° 5' N., a soft mud-flat, commonly called the Bar of the river, extends in a S.E. by E. direction (true), to the distance of seven miles and a half, with a depth over it, in every direction traversed by Mr. Schomburgk, of seven feet and a half at low water. Continuing in this south-easterly direction, across the entrance of the river, a channel of two miles wide, with eight feet and a half water, occurs; then a sandy patch of five feet (its centre exactly in 6° N. lat.) of about one mile long from north to south, by half a mile in breadth, and again a channel two miles wide with eight and a half feet water, between the sand and the Dutch coast, and either of these channels may be used by small craft bound to the Dutch port of Nickierie, taking care to avoid this patch of sand, of which the *lead*, if attended to, will give due warning. In the centre of the eastern channel, which should be preferred by vessels bound to the Dutch coast, a depth, gradually decreasing from seaward, of eleven, ten, and nine feet, at the distance of one mile and a half off shore, may be carried to the bar of the river Nickierie, which has a depth over it of eight feet; but as the entrance is only 200 yards wide, vessels that wish to run up the river half a mile to the settlement should only cross the bar with the Battery Point bearing between E. by S. and E.S.E., which will lead up to the anchorage off the fort in ten feet water; soft mud.

To return to the westward. From the south-eastern extremity of the before-mentioned mud-flat, which stretches from the western shore half across the river, a bank of sand (with only five feet water), seven miles and a half long by nearly two in width, extends to the southward directly in the centre of the river, leaving a channel two miles wide on either side, with nine and ten feet at

low water. The bank lies between 6° 2′ and 5° 54½′ N. lat. At its southern extremity this bank dries at half tide. Supposing, therefore, a vessel, not drawing more than nine feet water, bound to Skeldon or any plantation higher up the river, and desirous of entering on the western or British side, she may approach boldly in any direction at half flood (the proper time for entering) till the houses at Mary's Hope bear due *west*, at which time she must not be more than *three miles* off shore; and she should keep on this parallel till a remarkable, lofty, umbrella-shaped silk cotton tree (an excellent land-mark) bears S. by W. (true), when she may safely shape a due south course, in from ten to fifteen feet water, up the first or sea-reach of the river, varying her course as she ascends according to the winding of the stream, but as a general rule keeping the bold shore aboard.

As the wind is constantly from the eastward there can be no difficulty in entering or leaving the river, and by using the western entrance the great central sandbank, which is the chief danger, is left to windward. The current is strong in the wet season, from three to three and a half knots an hour, but as it sets N.N.E. and S.S.W., or nearly in the direction of the river, it is not of so much importance, yet should not be neglected; above all, pay strict attention to the lead.

In approaching from the eastward keep within one mile of the Surinam shore, gradually closing to half a mile as you approach Bluff Point, when shape a mid-channel course between Parrot Island and the western shore.

It may be seen, by inspecting all former charts of the entrance to this river, that the difficulties only commence where *they* place the southern points of the banks—in fact, prior to this, it is believed no survey of the river existed. Its value will be more apparent, when we consider that four estates on the British side of the Corentyn produce 2000 hogsheads of sugar annually; all of which, with the other productions, timber, &c. the planters are obliged to send to Berbice to be shipped, and for which purpose they are obliged to keep up schooners or droghers at a very great extra expense; whereas by the eastern channel, any vessel, drawing only ten feet water, might safely sail forty miles up this river, and ship the produce at once from the various estates on which it is grown.—Ed.]

XXIII.—*Diary of an Ascent of the River Berbice, in British Guayana, in* 1836-7. By Robert H. Schomburgk, Esq., Corr. Mem. R. G. S.

Deceived by the Caribs, short of provisions, and frustrated in our attempt to surmount the cataracts, the expedition up the river Corentyn was obliged to return to Berbice early in November. On my arrival at New Amsterdam, I lost no time in making the necessary arrangements for ascending the river Berbice, which is but little better known than the Corentyn, and as being the only alternative left me at this advanced period of the season. I was careful to provide a double stock of provisions, as the difficulty of finding a sufficient supply is one of the chief obstacles to travelling in Guayana. My party, with the exception of Lieut. Losack, was the same as before; the boats' crews consisted of Arawaaks, Warrows, and three Caribs, but who were scarcely equal to man the four corials.

Nov. 25, 1836.—Quitted New Amsterdam with the flowing tide, and paddled rapidly up the first or sea reach of the river Berbice, in a south direction for about three miles, when the river turns abruptly in a W.S.W. direction; its average width about half a mile. As the sun rose on the following morning and dissipated the fog, the river's banks presented a continued line of cultivation; thousands of mocking-birds (*Oriolus Perisis*) rose from a wide-branching and aged orinok tree (*Erythrina* Spec.?), where they had roosted for the night, and gradually dispersed in all directions. As we proceeded, cultivation continued on the eastern bank, but on the opposite, Nature had reclaimed her own. What a contrast do these shores now present, when compared with their aspect towards the close of the last century! Then plantation followed plantation as far as the Savonette, the last estate of the Dutch West India Company, about sixty miles from the sea: of the greater number of these scarcely a vestige now remains, yet free labour and capital alone are wanting to restore the former scene of beauty arising from high cultivation, uncontaminated by the baneful influence of human slavery.

Just before reaching the latitude of 6° N., the river makes a circular bend of about a mile in diameter, and at the north-western angle of the bend two small tributaries fall in, close to which is the site of a once-famed plantation named *Daagerad,* now a wilderness. This spot is noted for the height and strength of the *abapúri,* or bore, which is said to rise here from twelve to fifteen feet, and has caused on several occasions the loss of life and property. The peculiar bend of the river will account for its strength. The depth of the channel here, which is much narrowed, is twenty-five feet, but a mud bank projects from the

south-eastern shore off Daagerad full three-quarters of the width of the river. At the south-western angle of this bend a small stream or creek connected with the river Abary, which flows a few miles to the westward, joins the Berbice. It is called *Abari-Itabú,* Itabú signifying creek or expanse of water, and answering to the word Kirahagh of the Caribs on the Essequibo. At night we halted at a cottage called *Noytgedazt* (not expected), and to us so it proved, and we were glad to take shelter from a violent thunder storm which lasted till daylight. The resident here cultivates rice with much success, and he only wanted labourers to enable him to realize large profits; the sample he showed us was very fair. Here as well as elsewhere during our progress up the river, we received great civilities from the inhabitants; to be a stranger insured a welcome.

Nov. 28.—In latitude 5° 50′ N. the river makes another sweep to the N.W. At its southern angle is the site of Fort Nassau, the former capital of Berbice, under the Dutch, at a distance of forty-five miles from the sea, by the windings of the stream. The anchorage here is good in six fathoms water, and spacious, as the fort commands two reaches of the river; current 2½ an hour. As we ascend the river narrows considerably, but retains a depth of from five to seven fathoms. At the south-western angle of this sweep we found the first rising ground at thirty miles direct distance from the coast, formed by hillocks of heaped-up sand, probably the boundary line of the gradual receding sea of a former era; they are about fifty feet high, and called *Hitia* by the Indians; it is this rising ground that gives the river flowing towards the north the abrupt bend to the south-east. Here was formerly the site of a post, now only tenanted by some Arawaaks; four miles south of these sandy barriers the brook Kaderbicie joins the Berbice from the west: it is said to be connected with the stream Abary, by a short portage, while the Herounie unites the Abary with the river Maicony. From Kaderbicie a short path leads across savannahs to the river Wieronie.

Five miles higher we brought up for the ebb tide at the mouth of the stream Moshieba: the campaneros or bell-birds (*Ampelis carunculata*), the daras of the Indians, were tolling in all directions: except in the Conocon mountains, on the Essequibo, I had never met with them in such numbers. Several Arawaaks live in the vicinity of this brook, and a path leads hence to the mouth of the Wieronie, which may be walked in an hour, while it took us nearly five hours to follow the river's course, which at the junction of the Wieronie in latitude 5° 42′ N. is abruptly turned to the S.E. for five miles, when it again assumes its usual north course. At the north-eastern point of confluence is the site of an old redoubt and a church; the depth of the river is here seven fathoms.

At *Peereboom,* one mile farther south, sandy hills again occur, and at their back an extensive savannah stretches to the westward. Peereboom is the residence of Mr. Duggen, an industrious wood-cutter, and from whom we received every civility and assistance. As I deferred the examination of the river Wieronie till our return, we pushed on for *Wickie,* about ten miles farther south, situated on the western bank at the junction of the river of that name with the Berbice. Immediately at the back of Wickie is a marsh, then sand-hills about forty feet high occur, and separate the marsh from the savannah. This spot is the residence of Mr. M'Cullum, who has a very extensive wood-cutting establishment. We halted here to rate our chronometer. The sand-hills are abrupt, and consist of fine white sand; no organic remains have been found in them; they remind me of the sand-hills formed by the waves and breakers along the north-western coast of the island of Anegada.*

The wallaba (*Dimorpha* Spec.?), one of the most useful trees for posts, shingles, and staves, occupies the soil almost exclusively here. On issuing from the wood, two miles to the westward of the settlement, a large undulating savannah partially wooded was before me. Here was an Arawaak settlement of five or six huts; the men were all absent and employed in wood-cutting, the women seemed rather frightened at my appearance. I asked for some water, which was readily presented to me in a gourd, but this done, the woman retired to the corner which she had previously occupied. After having given some small presents to the terrified children, I continued my walk across the savannah until the brook Etonic stopped my further progress. I found some very interesting savannah plants, and returned home almost loaded with them. While absent, some of the Indians had killed a conocoushie or bush-master, the most dangerous snake which Guayana possesses; it measured a little more than six feet, and its formidable fangs were nearly half an inch long.† Mr. M'Cullum told me that several of his men had at times been bitten by them: the remedy he had adopted was scarification, to extract the fangs which generally break off in the wound, and then the application of cupping by means of a glass and some spirit set on fire; oil and strong purgatives are also administered.‡

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* See Journal R. G. S., vol. v., p. 28.

† This was probably only a young snake, as in the specimen brought home by Dr. Hancock and preserved in the Zoological Museum, the fangs are fully an inch long, and seven in number.—Ed.

‡ Absorption of the virus is often so rapid as to destroy life in a few minutes. None of the reputed antidotes are to be relied on. *Not a moment should be lost:* immediately on the wound being inflicted, let a companion *suck the wound* for an instant; then scarify with a lancet, a knife, or a piece of broken glass; apply the mouth again and *suck the wound* with all his might, squeezing and pinching up the skin and flesh from the bottom of the wound by the thumb and fingers of each hand, and by the use of his teeth. If this be done without any delay, the venom of the

Mr. M'Cullum has a large wood-cutting establishment where often 200 Indians and upwards of fifty negroes are constantly employed by him in cutting and squaring timber, with the exception of the time they are absent to put their provision fields in order: as head of the firm under which the business is carried on, he has resided here for many years, and has had good opportunities to form an idea of the comparative value of Indians and negroes as labourers. He says—"I have invariably found that the Indian sets to work at once with good heart, and remains at it until his task is finished, which is generally two or three hours earlier than the negroes; but not satisfied with this, he continues to work in his own hours, and I know many an Indian, who besides his regular wages, earns from two to three dollars a week. They are also in my opinion more honest. Were the Indian well treated, he would prove an invaluable labourer." That Mr. M'Cullum treats them well is proved by the number which he has collected around him: unfortunately this is not the case with all who employ them. To secure an Indian as a labourer, both foul and fair means have been resorted to: he is supplied with articles on credit sometimes to a large amount, provided he is able to work, being aware that the Indian considers himself in duty bound to work for his creditor until the debt is paid; but many wood-cutters use every means to prevent his getting out of debt by constantly supplying him with more goods and large quantities of that bane, rum; thus the poor Indian is always kept in a state of bondage. This unjust traffic is the fruitful source of misunderstanding between those who employ Indian labourers: if thus an Indian has received money or articles from two or more settlers, which are often put in his hands when intoxicated, it causes quarrels among them, and the Indian's confidence in his employer is shaken, he finds himself harassed, and when least expected, his huts and fields are abandoned, and he emigrates to another district, if not to another colony. The spirit of emigration has lately much increased, and is particularly directed towards Surinam. Mr. M'Cullum observed to me—"Give me a few thousand guilders to spend in presents, and I would entice every Indian in the upper river Berbice, were it my object, to follow me to Surinam." I myself also well know that little will induce the Indian to leave his residence; he is less tied to his birth-place than many other uncivilized nations, and being of a roaming disposition, he abandons his fields to the wild beasts of the forest, and plants his

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most deadly serpent may be extracted without ill results. After absorption of the virus into the system, sweating should be promoted by the use of vapour baths, and by sudorific remedies, as confirmed by the usage of the natives in hot climates, and as practised by the ancients under the name of *Alexipharmics*. See Notice by Dr. Hancock in Quarterly Journal of Science, 1830, and the *Lancet*, No. 340.—Ed.

hut elsewhere on the slightest provocation. I noticed the Indian's habits for wandering in my former reports; while here, I received another proof, in *Kanaima*, a chieftain of the Macusie tribe, whom I left comfortably settled in a substantial house at Annay, and he had then no thought of leaving his residence and his rich provision fields, at the foot of the Pacaraima mountains; now he is felling trees and toiling to put but a small spot of woodland in cultivation for subsistence. If steps are not taken to cultivate the Indian's good-will, the colony risks the loss of many valuable individuals. If the Indian population is of sufficient interest to the colonist, my humble opinion is, that a protector of Indians should be appointed, with sufficient authority to enforce the fulfilment of a fair contract between him and his employer. The Indian of British Guayana is a heathen, and while the aborigines of all other colonies and countries have had religious instruction offered to them, he alone is neglected; with the exception of the mission at Barteka Point on the Essequibo, established not for the sake of the Indians, the colony of Guayana has not a single institution for the instruction and conversion of the Indian. How great the contrast in the neighbouring state of Columbia, where the advance in civilization is solely due to the exertions of the Roman Catholic missionaries, who have proved that the Indian is capable of receiving, and will gladly embrace religious instruction, if offered to him!

The weather was very unfavourable during our stay in Wickie for celestial observations; the means of six observations gave me as latitude 5° 33′ 47″ N., and the longitude, by chronometer, 57° 38′ W. The width of the river was ascertained to be 145 yards, with an average depth of five and a half fathoms: the tide rose here during the springs five and a half feet. While here we had a proof of the speed of a corial, which went twenty-six miles up the river, and returned within twenty-four hours.

Dec. 4.—We left Wickie, on our ascent of the river. At *Paripi*, four miles farther, the same sand-hills or reefs are close to the river's western bank, with an Arawaak settlement on their top. We stopped at the mouth of the stream, *Kabiribirie*, famed for its cold waters. I found, however, the difference not so great as I should have expected; at five A.M. the air was at 80° Fahr., the water of the river Berbice 80° 2′, and that of the stream, 77°.

Dec. 6. We halted the next day at an early hour at Moracco, where Mr. M'Cullum carries on his wood-cutting establishment. At starting, at 5 A.M., the thermometer was 68°, while the water of the river was 11° warmer, namely, 79°. The trees in the vicinity of Moracco consist chiefly of different species of Wallaba *

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* Eperua of Aublet; Panzeria of Willdenow.

(*Dimorpha falcata*) some green-heart or seperi, Mora, Yaruri paddle or roller-wood, Kakarally and Wamara. At two miles' distance from the river commence savannahs, extending towards the river Demerara. They are said to be inhabited by Indian tribes, who never visit the abodes of the colonists: by means of barter they procure powder, shot, knives, palempores, &c., from those Indians who keep up communication with the coast, and give them hammocks, spun cotton, and crab-oil in return. My informants could not give me an estimate of the number of these Savannah Indians, but from their expressions, they must amount to upwards of thirty settlements, probably about 500 individuals. At *Monbacca*, a few miles above Moracco, the river assumed a strange feature; it became very winding in sweeps not half a mile in diameter, and being narrowed in on either side with patches of a coarse long grass (*Panicum*), and Mocco-moccos (*Caladium arborescens*), it appeared as if there were no outlet: the river turns at a sharp angle, and the distance from shore to shore is not more than thirty-five yards. Its width also became very variable, as at times it widened out into a lake. Here, too, commence the inlets, generally called Itabú by the Indians, and which become very frequent as we ascend. A small island occupied the middle of the first inlet, and on it capricious nature had planted a number of trumpet trees (*Cecropia Peltata*), in regular rows. They were clothed from their base to their summit with a species of convolvulus, while the under-wood was similarly overrun. At Monbacca, on the south-eastern bank of the river, is an Indian settlement. Beyond we came to some steep sandy hills, about 100 feet high, and the highest yet seen of that formation. I scrambled up them and was richly rewarded. The prospect over undulating ground extended to the south-east upwards of fifteen miles; and the number of hills of the same formation as that I stood upon, covered with dense wood, formed one of the finest views of woodland imaginable. Immediately below our feet the placid river spread out as a lake, and distinctly reflected the magnificent trees which margined its banks. Beyond was an immense extent of wood of every tint and hue, from the bright yellow-blossomed *Hakea* to the dark lucid green of the gigantic Mora. The view in the distance was closed by parallel ranges of thickly-wooded hills; behind us was an extensive savannah, with beautiful slopes, covered with verdure and clusters of trees. A little beyond the river is narrowed to less than thirty yards, and its current much increased, when it again widens, and forms several small islands. At the brook *Yuacari* a path leads to the river Demerara, which is frequently made use of by the Indians. They follow for two days the windings of the brook, and thence one day over land.

Whilst at Wickie I had engaged an Accaway family to accompany me, consisting of the chief, named Andres, two men, four boys, and three females. The men were divided among the corials, while the women and three of the boys conducted their own craft, one being a small corial, the other a woodskin. The Arawaaks and Accaways of the upper part of the river generally use woodskins in lieu of corials. They are made of a single piece of the tough bark of the *Murianara* tree, which grows to a very large size. An incision is made to the extent required in the bark, which is removed by driving in wedges: when loosened from the wood, it is kept open by cross sticks, and is supported at the extremities upon two beams, in order to raise those parts of the woodskin. Vertical incisions at about two feet apart, and a few inches in depth, are then made, and the parts secured afterwards by over-lapping. It remains for several days exposed to the weather before it is fit for use. Though the woodskin is so crank that the slightest motion, when once seated, renders it liable to be upset, I have frequently seen three men and their baggage in one. Their great advantage is, that being flat, they can float where a common corial of the smallest description cannot pass, and so light, that in crossing cataracts, one man can easily carry his boat on his head. When propelled by one man, he squats in the middle, and paddles on either side. Great care is requisite in stepping in or out of them, as if upset, they sink almost instantly, owing to the great specific gravity of the bark. The two boys who conducted the woodskin on the present occasion were perhaps not more than eight years old, and we were highly delighted to see how ably they managed it. The boat seemed to fly through the water, and the juvenile steersman directed its course so well that it never grounded, though it went over places where there was not more than eight or nine inches water. They also were very expert in the use of the bow and arrow; and wherever they thought their well-directed arrow might procure an addition to their meal, the woodskin was halted, the bow strung, and off flew the pointed arrow, and when taken out of the sand, which the water barely covered, we generally observed a fish struggling for liberty. In spite of these occasional detentions, they were always in the van when we were to stop for breakfast, or at our night's quarters.

Dec. 8. We halted next morning for a few minutes at a new settlement, just commenced by a Waccaway family. I was not a little astonished to recognise in the head of the settlement an old acquaintance of mine, called Philander, who had accompanied me on my expedition up the Essequibo. I left him settled with the Macúsies at Waraputa, and now I found him on the banks of the river Berbice. This is another proof of the unsettled habits of the Indian, and his want of attachment to localities. His fields

had been only lately prepared, and the trunks and branches of felled trees were lying about in great confusion. However, he had planted Indian corn, pumpkins, &c.; and though the former was only a few months old, it could vie with what I had seen in Virginia. He expected to reap his first crop in about three weeks. We found him occupied in planting cassada and sugar-cane, both indispensable in an Indian settlement. We were much disappointed on arriving at the Accaway settlement, of which Andres was the chief, and found only a few miserable huts; indeed, they were in worse condition than any I had seen before. The Accaways, or, as they call themselves, the Waccaways, are a tribe of pedlars: they are constantly wandering, and they carry on a trade of barter, and are well known to make hard bargains. I was only able to engage Andres upon condition that I would permit him to stay a couple of days at his place, in order to prepare cassada bread for himself and for us. As this settlement was inconvenient for my observations, I proceeded half a mile further, to a large sand-bank; but the glare of the sun and the heat reflected from the sand were very annoying. The mornings and evenings while here were generally clouded, and even rainy, but about ten o'clock the sun shone out in all its force.

Dec. 10. Thermometer at 6 A.M. 73°; at 3 P.M. 92½°; exposed to the sun, 98°; bulb buried in the sand, 115°.

Hammocks form the chief article of trade between the Waccaways and the more industrious Macúsies. They are generally made of cotton twisted into cord, of which a net-work is formed, with the interstices about six inches wide, or less. At either end strings made of the silk grass or the palmated leaf of the Eta (*Mauritia*) are inserted. The Arawaaks and Warrows prepare their hammocks entirely out of the Eta cord, which they call *Eta vissieri*. The Caribs and Waccaways dye their hammocks red with the Arnotto, mixed with crabnut-oil, prepared from the seed of *Carrapa Guianensis*. I have seen an industrious Indian woman finish a common cotton hammock in a day. The time had now elapsed which I had granted the Waccaways to make the necessary preparations to accompany us; and in consequence of the unfavourable weather for observations, my further stay was of no advantage, though I was anxious to inspect the rate of my chronometer, which I feared was not steady. This settlement is in 5° 2½′ N. latitude, and 57° 58½′ W.

Andres arrived with two men less than he had promised. When we inquired for the stores of cassada bread which he had promised, he made every excuse. Warned by the example of the Caribs, I had sent daily to their huts in order to ascertain whether their women were occupied, and they were always found preparing cassada bread, and large piles of cakes were seen in

different directions: his excuse, therefore, that a number of Macúsies, who were with him, had taken it away, was not believed, and we went to the settlement, to ascertain the truth. No person was to be seen but a sickly woman; all the woodskins were removed, and the woman told us that the Macúsies and some of Andres' own men had left that night on their way to the Demerara river. We were therefore outwitted, and obliged to proceed without a fresh supply.

We had already observed at the Waccaway settlement some blocks of indurated clay: this morning we met the first rocks, probably of trappean origin, in latitude 5° 0′ N., and about 70 miles direct distance from the sea. They were but few in number, and on the river's western bank. The river itself was shallow, and impeded by numerous trunks of trees, which stretched almost across it, and occasionally obliged us to cut our way. As we ascended, inlets became numerous, and were frequently mistaken for the river.

The following morning we passed the brook *Yaríkí*. Its waters are ochreous, and of much lighter colour than the Berbice, whose muddy water formed a strong contrast to the bright yellow of the Yaríkí. The sound of rushing waters made us halt a little further south. We followed the noise, and discovered a small cascade, not unlike that of Itafé on the Corentyn, but the structure of the ledge of rocks over which it falls from ten to twelve feet, was different. The Waccaways called it *Idrue-wadde*, or *Tivuro-nadde.*

Here in lat. 4° 55′ N. at the distance of 165 miles from the sea, measured along the windings of the river, the influence of tide is no longer felt; it was but trifling at our camp, near the Waccaway settlement. The river is navigable to this point for flat-bottomed canoes, drawing two feet water; it now becomes less winding, and has a breadth of about eighty yards: we met further south a ledge of granitic rocks, on which we observed a great number of Indian picture writings. They resemble those I observed at Warapoota * in the river Essequibo, but they were neither so regular nor on such a large scale as those we had seen in the river Cabalaba and the Corentyn. The granite here is red, the surface smooth, and covered with a thicker crust of the

* See Journal R. G. S. vol. vi, p. 321, and vol. vii., p. 287. It is worthy of remark that the Indian hieroglyphics seen by Mr. Schomburgk at Warapoota on the Essequibo, and those on the Berbice and the Corentyn, are all within a few miles of the same parallel of latitude, or rather it should be noted that the ledge of granite or gneiss on which they are engraved here assumes an E.S.E. and W.N.W. direction, and that an E.S.E. line of 100 miles in length would strike the three spots on which the chief hieroglyphics have yet been found in British Guayana; not that this is their limit in America; on the contrary, they have been traced from west to east upwards of 600 geographical miles, and probably are yet more extended. —Ed.

black oxide of manganese, repeatedly mentioned, than I have before observed. I am of opinion that the process which produced it does not go on at present. In many places, from weather or other causes, the outer crust has split, and thus the black coating has been removed: this must have taken place a long time ago, as we found lichens and mosses, and in some instances bushes growing on such parts. Some boulders which are now lying at a distance from the banks of the river, and which are only once a-year subjected to the flood during the inundations, possess the coating equally with those which are constantly exposed to the waters. It would, therefore, seem that the formation of the black coating was coeval with the cause that deposited these blocks.*

Dec. 13.—We soon after passed the first rapid, called by the Waccaways Marlissae, and several others followed in the course of the morning; at eleven o'clock we saw some hills before us, where it was evident that the river had caused a break; it turned almost at right angles, and the point from whence the river issued was so completely hidden, that we were almost persuaded the river's course was here at an end. The Indians from the Corentyn appeared to be of the same opinion; they set up a shout and stared. The Waccaways smiled: they had been here before, and knew that it wound between two hills: rapid followed rapid: in the afternoon we arrived at a point where the contracted river forms an entrance to a natural basin, bordered by hills: it is followed by a second, the entrance to which, through barriers of rocks, is only eighteen yards wide; the basin spreads in the form of a curved lozenge, and is upwards of 530 yards long, from west to east, by 300 yards wide, with a depth of ten fathoms. At its northern bank the river rushes violently over a dyke of rocks, and forms the cataract Itabrú. I at once saw the impossibility of getting the loaded corials over the fall, and orders were consequently given to unload and transport the baggage to the head of the cataract: the difficulties connected with such an undertaking were various; we had to sling our chests, barrels, &c. to poles, and raise them over heaps of boulders, some of which were ten feet high, and their surfaces smooth as glass. The transport of the baggage effected, the question arose, how to get the corials over. The most eligible way appeared to be to force them through the rush of water: on

* This incrustation or burnishing of the rocks is a curious subject for inquiry. Granitic rocks with this black coating have been found in Africa as well as in South America, and specimens from the falls of the Orinoko, from the cataracts of Syene, and from the rapids of the Congo, may be seen placed side by side in the British Museum; yet all, we believe, from rocks subjected to the rapid action of *fresh* water; but the observing eye of Mr. Darwin has lately detected a similar formation at Bahia, in Brazil, occurring near the sea-shore, and only within the limits of the tide's action, where the surf would seem to produce the same effect as the cataracts in the above-named rivers. See Mr. König's letter to Mr. Barrow in App. to Tuckey's Voyage to the Congo.—Ed.

the following morning we made the attempt with the canoe "Maconochie."

Dec. 14.—After the most courageous of our crew, Hendrick, a half Indian, or *Cobb*, had with much risk gained one of the rocks in the middle of the cataract, the end of the boat-rope was thrown to him; he then carried it to a less dangerous place, which the most expert swimmers of my Indian crew had reached meanwhile, and thence they drew the corial by main force through the opposing waters, the steersman having secured himself to the corial, directing her course by means of a large paddle. We were occupied the following day in transporting the baggage of the other corials, and succeeded so well, that by evening there was only one boat below the fall. The situation of our camp was very picturesque; it afforded a prospect over the basin to the hills which encompassed it, one of which, a mile distant, rose to a height of 511 feet (measured trigonometrically), while those contiguous to the basin were from 150 to 250 feet high. The weather continued unfavourable for celestial observations; but from several observations of the sun, when near the meridian, I found the latitude to be 4° 49′ N.; an unsatisfactory observation, for time gave me as longitude, 58°. Our crew having exerted themselves to transport the corials and baggage to the head of the cataract, I had no reason for refusing the request of Andres, the chief of the Waccaways, for permission to dance. The dance of the Waccaways resembles much that of the Caribs; the same monotonous and dirge-like song accompanies it; the motions are almost the same; they move forward sideways, stepping with the right foot; the right hand is placed upon the neighbour's shoulder, and the left hangs motionless by the side; they generally describe a circle in their movements, and when the dance is finished, the leader of the column sets up a shout, which is echoed by the dancers.

Dec. 15.—Early next morning we conveyed the last corial over the cataract. Hendrick, whom I mentioned before, as having selected the most dangerous situation, in the middle of the cataract, lost in the attempt his footing, and was immediately swept away: it was a period of the greatest anxiety from the moment we saw him carried away, until he grasped the rope and was drawn ashore: one foot further and he would have been dashed with violence against a large boulder, which rises ten feet out of the water, and against which the stream rushes with the greatest fury. This cataract has been visited several times by some of the most enterprising colonists: we found their names and initials cut on the surrounding trees, but they did not explore many miles further. After we had passed a second and a third cascade of less height, we observed thickly-wooded hills in the south, higher than any we had seen in the Corentyn: they formed a ridge running south-

east and north-west, resembling a gigantic wall, and terminated to the westward in a peak, estimated at from 800 to 900 feet, and which we named Parish's Peak.*

The river is so much impeded, that we continually met with rapids and cataracts; the progress of our ascent was, therefore, slow, and after two days of the most fatiguing labour, we were only five miles distant from Itabrú. It took us frequently two hours to travel over a distance of 100 yards, and the combined crews had great difficulties in drawing the corials over them. My own crew consisted of individuals of the five chief tribes of British Guayana, named Arawaaks, Warrows, Caribs, Waccaways, and Macúsies. I was surprised to see how well they agreed together: while we were *en route*, the service on which they were employed obliged them to mix with each other; but scarcely were orders given to halt for the day, when the different tribes separated and lodged apart, with the exception of the Macúsies and Waccaways, who lived together: there appeared something peculiar in their manner towards us, which I did not like, and I determined to watch them. As we advanced, the kaymans or large alligators became very numerous. We met them frequently in the middle of rapids, with the head above water, and their jaws partly open; they allowed us to approach close; their tenacity of life is surprising; we fired at one thus floating, and the ball took off the further end of the snout; it received immediately afterwards another ball in the hinder part of the skull, which appeared to have taken effect; nevertheless, the Indians were not sparing in their blows, and when there was not much likelihood of its possessing a spark of life, it was deposited in the bow of one of the corials. Whilst the corial was drawn across the rapids, it was found to be in the way, and as it had remained motionless since it had been put in, two of the Arawaaks got courage and took it up in order to lay it in some other place: they had just effected this, when at one bound it jumped out of the corial into the river, and disappeared. The two Indians, I need scarcely say, looked quite stupified, and never after could be persuaded to touch a kayman. The next day we cut a piece upwards of three inches out of the windpipe of a kayman, and then considered ourselves secure; but to our astonishment, an hour after it was found still alive: a strong knife was driven by main force into its head and brain before it expired. These facts would have appeared to me incredible, if I had not seen them myself.

We toiled on, through rapids, one following the other: the hills continued on our right; those on the eastern bank of the river were of less height. These regions appeared to be the fa-

* After Sir Woodbine Parish, Vice-President of the Geographical Society, who takes a lively interest in everything connected with South America.

vourite abode of the reptile tribe. The guanas were so numerous that, awakened out of their reveries by the approach of our corials, when basking on a tree near the bank of the river, we saw sometimes three plunge at once from a height of twenty feet into the water, and disappear almost instantly: the splash thus produced was heard at some distance, and produced always a cry of disappointment from our Indians at having lost the opportunity of adding to their food. Mr. Vieth shot one five feet nine inches long, including the tail of four feet two inches. Several were caught while swimming in the water. Two of the lighter corials that had preceded us over a rapid had discovered a Commoudie snake (*Boa Draco Gigas*); it was lying inert in a kind of brushwood, and had just slipped its skin. When we came up Mr. Reiss had fired a ball at it without having taken effect, and it was slowly retreating towards the water: at this moment Hendrick jumped ashore, and dexterously slipped a noose round its head, and was on the point of securing it, when the snake turned round and made a motion as if to dart at him: at this attack all his former courage gave way, and he retreated with the greatest precipitation over bushes and rocks into the water. The Indians all stood petrified; they could not be induced even to put a hand to the rope to draw the snake out of the wood, and we ran a fair chance of losing our ropes also, when Mr. Cameron fired a timely ball rather behind the head into the neck, and Mr. Vieth succeeded in catching the head in a noose: it was now quickly despatched, and secured in the boat: it measured sixteen feet four inches in length, and twenty-eight inches in circumference: while skinning it forty to fifty eggs were discovered, which had not yet come to maturity.

The Flora of the river's banks was not much diversified. I observed, however, some plants which hitherto I knew only from description, and which were highly interesting in consequence of their peculiar formation; among them were the *Marcgraavia umbellata* and *Norantea Guianensis* (Aublet): the former was very abundant; it may be called a ligneous twiner, though its branches are pendulous, but they are so more in consequence of the flowers, which being weighty and increased by its peculiar bractea, causes the branches to hang down. It is frequently parasitical, and I have found it in such various shapes, that at the first glance I have mistaken the young branches for a *Lygodium*. The flexible branches are thickly set with alternate leaves of a lanceolate form, and are terminated by flowering umbels, which, with the singular form of the bractea, resemble a chandelier: the flowers are insignificant, but remarkable for the *calyptra* with which the receptacle is covered: as soon as it falls off the stamens drop shortly after. The most curious organs of the plant are, however, the pitcher-shaped bractea, of which there are generally four or five

attached to the flowering stems, and surrounded by the flowers in long peduncles. The bractea is fleshy, cucullate, and hollow; the opening is wide on the top, and decreases in size; it contains a tea-spoonful of a tasteless fluid.* Equally curious and more splendid in appearance is Aublet's *Norantea, Ascium Aubletii* (Schreber). Its branches are likewise flexible, and in common with many of the *Guttiferæ*, to which the genus is very nearly allied, it has sub-parasitical habits: the leaves are alternate, and so coriaceous that the upper skin, like a cuticle, may be removed: it flowers in endrisps, and the peduncles have a club-shaped appendage of a deep orange colour; the risp is from ten to twenty-four inches long. The flowers have five petals of a deep crimson, but so small that they are entirely eclipsed by the brightness of the orange-coloured bractea; each flower has one of the bractea appended to its peduncle, and I counted on one of the risps 325: an idea may, therefore, be formed of its beautiful appearance where the climbing shrub overruning some huge tree, many hundred flowering risps are displayed. It forms one of the greatest ornaments of the Flora of Guayana. While speaking of plants and the highly interesting botany of these rivers, I must not omit a species of *Capparis*, which grew along the banks of the river: it was a tree of moderate size, and every afternoon about four o'clock was so much covered with its snow-white flowers, distinguished by its innumerable stamens, that it afforded a beautiful sight. At sun-rise the flower detaches itself from the disk, drops into the water, and is carried along by the stream; we met, therefore, thousands early in the morning floating downwards, and took it generally as a sign that no rapids were in the vicinity, as we but seldom found the tree in such situations.

Dec. 18.—We started this morning early. Our advance, however, was of short duration: while turning round a sudden bend of the river, a series of formidable rapids was before us. On examination I found that they extended in an eastern direction for upwards of a mile and a half, and that, besides five cataracts, we should have to pass several rapids before we came to still water, and should require five or six days to transport corials and baggage over the dykes. I became, therefore, apprehensive that our provisions might give out, and I resolved to send a corial back to Mr. M'Cullum's wood-cutting establishment for a fresh supply of provisions. Mr. Reiss kindly offered to command it, and he left us next morning.

My first intention was to have a road cut along the river's bank for the transport of our effects; but I found it impracticable, the rising ground consisting of numerous boulders heaped upon each other; and as the crevices were only partially filled up with mould, it would have been impossible to place rollers for the conveyance

of the corials; I preferred, therefore, to have the baggage carried over the different ledges of rocks which cause these falls, and to drag the corials after. The cataracts are formed by a continuation of the range of hills which we first met with in 4° 55′ N. lat.; its direction is south-east, and the valleys appear to be parallel nearly: a continuation in a north-western line leads to the Twasinkie and Coomootie* mountains of the Essequibo, which are a north-eastern off-set of the Sierra Pacaraima: a line continued to the S.E. along this range would strike the Marawini mountains in the 3rd parallel; so that the Sierra Acaray would be connected with these hills on the Berbice and the Twasinkie mountains on the Essequibo, which are again joined to the Sierra Pacaraima, about the 4th parallel of latitude. The nature of those rocks and of these on the Berbice is, however, different: while the former consists of granite and its modifications, these on the Berbice are more of trappean origin: the direction of their strata is N. 35° E.: they dip to the west by north, and the strata have evidently been disturbed since their deposition: various examples of cross currents are evident, and the beds are sometimes contorted and cut off by faults, which are filled with a species of wacke of a red colour: the angle of the regular beds amounts to upwards of 80°. The rocks, like those at the lower falls, are remarkable for large holes, smooth inside, and often from two to three feet in diameter: the rocks might almost be called cavernous. Where the current, during inundations, has excavated channels in the soil, I observed numerous boulders of about four feet in diameter, decidedly of the same formation, but much more covered with the black coating before mentioned, and exhibiting ripple marks.

Our transport over these ledges of rocks advanced but slowly; we had to unload and reload the corials four times, and as, in consequence of the shallow water at the rapids, we could only carry half a load at a time, an idea of the harassing work may be formed. Three corials were thus at the head of the cataract in the evening of the 21st, when next morning, at the time the rations were generally distributed, the information was brought to me that the Macúsies and Waccaways, with Andres at their head, had decamped, and were no where to be found. We had been accustomed to their freak of having their camp further removed from ours, than any other of the tribes who were with me, and it was not considered singular when we found that the same was the case at these cataracts: there were no signs that they had had fire during the night, which is an indispensable article to an Indian, and there was no doubt left that they had escaped the previous evening. No colonist had ever been able to induce them to go higher up the

* See Journal R. G. S., vol. vi. p. 362.

Berbice than the fall of Itabrú, and when they saw that it did not offer an insurmountable obstacle to our progress, they expressed their astonishment, and related horrible stories of mountain spirits, gigantic snakes, and thousands of kaymans, which were said to be able to swallow a corial with its crew and baggage, in hopes it might have the desired effect: then came the demand that they might be allowed to dance as before named. The following morning I had heard that the women, who had accompanied them hitherto, were to return to the settlement, and from that moment they must have resolved to leave us secretly as soon as an opportunity offered; and they effected it on the night of the 21st, after having broken open our stores of biscuit and wine. Our crew being already weakened by Mr. Reiss's absence with one corial, and many of those who remained with me being sick, I relinquished all idea of pursuing them.

On the 21st and 22nd of December, the hourly observations recommended by Sir John Herschel were made: celestial observations were very precarious. I had been up three nights in succession to procure a set of lunar distances, but in vain. The means of the meteorological hourly observations on the appointed days were—Bar. 29·758; att. therm. 76° 5′ Fahr.; extern. therm. 75° 7′; wet bulb, 73° 8′; surface of the river 79·7.; the height of the spot above the level of the sea was ascertained to be 245 feet; the lat. 4° 41′ 45″ N.; the long. 57° 54′ 10″; var. 7 east. The night from the 20th to the 21st was one of the coldest I ever experienced at a low situation in Guayana: at two o'clock in the morning of the 21st the therm. stood at 64½°, and the water of the river at 72°. Christmas-day approached while we were at the Cataracts: though but few of our Indians were aware of the occasion and origin of this joyful day, and equally unable to understand what I told them of the birth and atonement of our blessed Saviour, yet I wished that they should participate in some degree in the better fare which we enjoyed on that day. Several pieces of salt beef were shared among them; and though not every one of the Indians would eat it, I found them not so scrupulous as those I met during the former expedition on the Rupununy: they received otherwise additional allowances, and every four men a bottle of rum and some sugar. We enjoyed, therefore, Christmas in our own way; and the proposal that as we could not learn whether these falls had any name, they might be called 'Christmas Cataracts,' was gladly adopted.

Mr. Reiss could scarcely be expected before three or four days more had elapsed. On the morning of the 27th we transported the last corial, which in case of necessity had been kept at the lower cataract, over the rocks. The river was falling, and diarrhœa and severe colds prevailed much among the Indians. I hoped to

conquer it by giving them occupation, and I decided to abandon one of the corials, as since the desertion of six of the Accaways I had not sufficient Indians to man them: we dragged the corial, therefore, on shore, and divided its load among the others. This night proved a sleepless one for us: we were but a short time in our hammocks when we discovered that our tents were visited by the coushi ant or yagerman, by which name the Creoles denominate the *Atta Cephalotes, or Migratoria:* they inflicted most merciless bites, and those who attempted to get out of their hammocks were glad to get back again: our poor dogs suffered the most; they could not get out of their reach, and they ran about the whole night howling, in consequence of the severe bites which they received. One of the columns of marching ants had moved up a tree, and whether it was in consequence of the immense numbers I know not, but we heard them dropping upon our tents as drops of rain from the leaves after a heavy shower.

Dec. 28.—Our progress was quite slow: we turned round a sudden bend of the river, when a most obnoxious effluvia greeted our noses, and we observed a flock of that curious bird, the king of the vultures, rising from a dead kayman: we did not succeed in shooting a full-grown bird; a young one was, however, procured, the feathers of which were just about to turn from black to white: this is a curious change, peculiar to several birds. There were upwards of from fifteen to twenty assembled round the carrion: they flew with the noise of heavy wings from branch to branch, until scared by the first shot, they flew deeper into the woods; the opportunity of glutting themselves was too inviting to be abandoned by a rapid flight. We were not very successful in procuring game, but we were indemnified by a large number of fish, which were as acceptable at the period, as they had been scarce for some time past: our crew procured fourteen large *haimaras*, one of the most delicate of the finny tribe in these rivers; their average weight is about 15 lbs. In order to catch them spring hooks are set in the evening, and when the fish, allured by the bait, takes it, it is drawn by the elasticity of the rod out of the water, and there it hangs until it is secured by the fisherman; but it is not man only who is anxious to secure the entrapped fish; among the foremost comes the kayman, which, attracted by the noise of the struggling fish, considers he has as much right to it as the Indian who sets the hook. In this piratical system he is assisted by the *pirai*, called by the Arawaaks *houma*, which slashes piece after piece from the poor captive, and when the fisherman takes his round, he finds nothing but the head attached to the rod. Those who set the hooks should, therefore, be constantly on the alert.

Dec. 30.—The kaymans are very numerous; one, including the

tail of four feet eight inches, measured fourteen feet. It is astonishing how far fool-hardiness sometimes carries the Indian, while at others he shows the greatest cowardice; he acts on impulse. The kayman lay motionless and apparently dead along the banks of the river. Salomon, the chief man of my Warrows, jumped a-shore, and after having given him a few blows with a cutlass across the head, attempted to force its jaws open with his hands: he desisted only by my commands: scarcely had he allowed the kayman's head to drop to its former position, when the monster snapped most violently at the Indian: it missed him, but got hold of an old stump of a tree, where we had to use the axe to get him loose. Mr. Cameron had shot another with a ball through the head, just under the eye: after having violently beaten the water with its tail, it rose to the surface of the river, its white shining belly turned upwards, and we considered it dead: one of the corials was sent to secure the head, but on its approach, new life appeared to start in its veins; it turned itself round, and rushed violently through the water: the foreman of the smaller corial, Hendrick, stood ready with the cutlass: it now turned its attack towards the assailant, and with its formidable jaws open, it rushed towards the bow. Hendrick got so much frightened at this unexpected display of teeth, that he even allowed his paddle, which he had in the other hand, to drop in the water, and fell back without directing a single blow. I instantly desired my large corial to be drawn across to hem the monster in: but it did not await our arrival, and with open mouth came violently towards our broadside, as if it intended to join the party inside, not a little to the consternation of its inmates, then struck against the side of the corial, sunk under it, lashing with its tail, and wetting us all over, and vanished in the deep water.

Jan. 1, 1837.—We made but slow progress; the river narrowed considerably, and numerous trees which, from age or the undermining effects of the current, had fallen across, disputed our advance, so that we were obliged to cut a passage. Nine out of ten were mora trees, one of the hardest woods of Guayana, and which by being immersed in water had increased in hardness: it took us two to three hours to cut through one of these trees, and there were sometimes three to four in succession; we had, therefore, hard work, and none but the women were exempted from using the axe. In order to increase the difficulties, many of our Indians were unfit for any work in consequence of indisposition; the entrance of the new year was, therefore, well calculated to enhance the feeling of disappointment, that we should at that advanced period be within so short a distance of the coast: a succession of adverse circumstances had taken place since we undertook the Corentyn expedition; difficulties beset us from the outset, and

though I battled most resolutely to overcome them, and was determined to advance as long as there was any possibility of making progress, and famine did not threaten us, I could not feel but doubly the mortification on the first day of the year. Such thoughts were passing through my mind when we arrived at a point where the river expanded, and formed on its eastern bank a smooth basin, the current of the river directing its course along the opposite shore. Some object on the southern point of the basin attracted my attention; I could not form any idea of what it might be, and I hurried the crew to increase the rate of their paddling; in a short time we were opposite the object of our curiosity—a vegetable wonder! All calamities were forgotten; I felt as a botanist, and felt myself rewarded. A gigantic leaf, from five to six feet in diameter, salver-shaped, with a broad rim of a light green above, and a vivid crimson below, rested upon the water: quite in character with the wonderful leaf was the luxuriant flower, consisting of many hundred petals, passing in alternate tints from pure white to rose and pink. The smooth water was covered with them, and I rowed from one to the other, observing always something new to be admired. The leaf is on the surface of a bright green, in form almost orbiculate, except opposite its axis, where it is slightly bent in; its diameter measured from five to six feet; around the whole margin extends a rim, from three to five inches high, on the inside of a light green, on the outside a bright crimson. The ribs are very prominent, almost an inch high, and radiate from a common centre; they consist of eight principal ones, with a great many others branching off from them; these are crossed again by raised membranes, or bands, at right angles, which give the whole the appearance of a spider's web, and are beset with prickles; the veins contain air-cells like the petiole and flower-stem. The divisions of the ribs and bands are visible on the upper surface of the leaf, by which it appears aerolated. The stem of the flower is an inch thick near the calyx, and is studded with sharp elastic prickles about three quarters of an inch in length. The calyx is four-leaved, each upwards of seven inches in length and three in breadth; at the base they are thick, white inside, and reddish brown and prickly outside: the diameter of the calyx is from twelve to thirteen inches; on it rests the magnificent flower which, when fully developed, completely covers the calyx with its hundred petals. When it first opens it is white with pink in the middle, which spreads over the whole flower the more it advances in age, and is generally found the next day of a pink colour; as if to enhance its beauty, it is sweet-scented. Like others of the tribe, it possesses a fleshy disk, and the petals and stamens pass gradually into each other, and many petalloid leaves may be observed which have vestiges of an anther. The petals next to the leaves of the

calyx are fleshy and possess air-cells, which must contribute to the buoyancy of the flower. The seeds of the many-celled fruit are numerous, and embedded in a spongy substance. We met them hereafter frequently, and the higher we advanced the more gigantic they became; we measured a leaf which was six feet five inches in diameter, its rim five and a-half inches high, and the flower across fifteen inches. The flower is much injured by a beetle (*Trichius* Spec.?) which completely destroys the inner part of the disk; we have counted sometimes from twenty to thirty in one flower.*

Our progress next day was scarcely two miles, the trees which barricaded our passage were so numerous. While the men were employed cutting through a large mora tree, information was brought that a herd of *Kairounies,* the large peccary or Indian hog (*Sus cystiferous major*), was feeding at a short distance from the river: all our guns were immediately put in requisition, and off we started; Acouritch, the Carib, armed with bows and iron-headed arrows in the van. I first came up with them, and found them in a pool of water, where they wallowed in the mire like our domestic hog: one appeared to stand watch while the rest enjoyed the muddy bath, the young ones of various sizes keeping the middle. When I was at a distance of fifteen yards the sentinel observed me, the bristles on the back rose, and it turned towards me, chattering formidably with its teeth; in the next moment it lay prostrate in the mud pierced by a rifle ball; but how can I describe the bustle, the rush, and the chattering of the tusks of upwards of 200, which immediately after were seen to seek security in rapid flight in the opposite direction! An Indian, who had come up by this time, fired after them and shot another, and the retreat was now perfect. I had loaded again, but hesitated a moment to wade through the swamp; the Arawaak, Mathias, observed it, and he requested me to give him my rifle and ammunition, and off he started with it. I heard four or five

* Mr. Schomburgk has sent to England a drawing of this beautiful flower, desiring that, if permitted, it should be presented to the Queen, with a humble request that it might be dedicated to Her Majesty and bear her royal name. To this Her Majesty has graciously consented, and has also given permission that this flower should be known by the name of

"VICTORIA REGIA."

Mr. Schomburgk will be highly gratified to learn that his discovery—the most beautiful specimen of the Flora of the western hemisphere—will henceforward be most appropriately distinguished by the name of our youthful sovereign, herself "the ROSE and the expectancy of our state."

The Society is indebted to Dr. Lindley for his kind and liberal offer to write a fuller description, and to superintend the engraving, of the flower, a copy of which has just been presented to Her Majesty.—ED.

shots shortly after at some distance on my right, and while yet calculating how many of them might have told, I heard a rushing noise, like a whirlwind, approaching through the bushes: the peculiar growl, and that awful clapping of the teeth did not leave me long in doubt as to its cause; it was evident that the herd had divided, and were coming directly towards me. I stood alone unarmed, and had not even a knife to defend myself. I know not yet how I climbed the lower part of a mora tree, when by they rushed, their muzzles almost sweeping the ground, and their rough bristles on the back standing erect: they might have numbered fifty. They came and passed like a whirlwind, and before I had recovered from my astonishment, I heard them plunge into the river and swim over to the opposite bank. The other hunters had not been so fortunate as I expected; excitement or fear made them miss where it would have appeared almost impossible. Including the one I had shot, three had been killed with guns, and one with an arrow: they were a most welcome addition to our stock, as we were already obliged to economize, and our endeavours to procure fish had not been successful.

The kairounie has been so well described that it is superfluous to dwell further on it, but there is an anatomical difference in the internal structure of the skull, which I do not find noted in the works on natural history which form part of my travelling library; it possesses only a small quantity of brain, which is protected by a double bone. Naturalists observe that it does not love to wallow in the mire; I found the whole herd almost buried in it, and we discovered afterwards another pool of water, where the marks of their having wallowed were evident enough. The liquor which flows out of the gland is highly offensive, and peculiar to both male and female; the latter produces only two young ones, frequently only one: the cry of the kairounie, when full grown, is a grunt, but that of the younger ones resembles the bleating of a goat.

Jan. 2.—The indisposition of the crew had so much increased that I had not sufficient hands to paddle; we were therefore obliged to encamp until the health of the party was re-established.

Jan. 4.—The report of two guns had been heard while I was absent on a hunting excursion, and Mr. Reiss was with us an hour after. Mr. M'Cullum, from whom the expedition received so many attentions and assistance, had most readily come forward to advance the desired quantity of rice, salt-fish, &c., and the corial had succeeded in passing the cataracts without accident. We had a severe thunder storm in the afternoon; while I was occupied observing the changes of the barometer and thermometer during its approach; the lightning struck a tree just on the opposite side of the river; the clap followed the lightning instantly,

and the reverberation was so severe that man and beast appeared startled. The barometer did not show any fluctuations; the thermometer, however, fell from 81° to 75°, when the rain fell in torrents; the thunder continued the whole night. We could not flatter ourselves with being particularly favoured by the weather, but it had not come to extremes as yet. I augured nothing good from its present appearance; the atmosphere was heavy and constantly clouded in the north-west: we were then so near to the change of the moon, which generally has a decided influence upon the weather, that I apprehended the setting in of the rainy season, and my surmises proved unfortunately correct. Active medicines had partially restored so many of the Indians that I was able to continue our journey.

Jan. 6.—We passed occasionally detached ledges of rocks, of the same nature, dip, and direction, as those at the Christmas Cataracts. The river narrowed considerably, and we were again under the necessity of having recourse to axes and cutlasses: its width amounted frequently to scarcely more than ten yards, while its current, sweeping at the rate of two knots over a sandy bottom, and partly covered with pebbles, was almost too much for my weakened crew—it required every particle of strength left in their sinews not to retrograde. The river frequently formed inlets, which were studded with islets of different shapes, covered with numerous palms, that bade defiance to any intruder by their sharp prickles, which were often three and four inches long.* Indeed the river was bordered by a dense forest of palms: they scarcely allow any other plant to grow up, and usurp all the moisture, air, and light. The under stratum of the soil, from lat. 4° 20′ to 4° 10′ N. is highly retentive; while, on the surface, it consists of a chalky marl, mixed with mould: it is particularly qualified for the cultivation of rice; the more so, since it is annually inundated and enriched by the deposition of mud, which would render manure unnecessary. If put under partial drainage, I am persuaded that these lands would produce two crops a-year.†

The current was now frequently our only guide for keeping in the stream, and with the greatest attention we were sometimes at a loss what direction to take, as occasionally the course of the river was entirely covered with bushes. The beautiful water-lily covered whole reaches with its singular leaves, nibbled at times by the Muscovy ducks; while numerous spurwings, sultana hens, and other aquatic birds, were walking on the surface of the leaf in search of insects.

* The Corrozo, from which a delicious wine is procured in the Oronoko.

† There can be little doubt of this, as we learn from Dr. Hancock that Mr. Bilstein, on the Essequibo, got two crops of rice and three of Guinea corn per annum. —Ed.

On a cursory glance, the explorer might have fancied that he had here reached the sources of the river, and that it rose in a lake; whence it issues in a stream not more than five yards wide. How astonished would he have been, had he been told that a few miles farther south the river widens again to 150 yards! As already observed, the stillness of the water induced me to search for another outlet; and, after some delay, we had cut a path for our corials, and were once more on a fine stream, unimpeded by bushes. We here found the iron-wood tree, and a new species of *dipterix*, the flower of which has a sweet perfume, resembling violets: it is called by the Indians *Itikieri. buri-bally;* the wood is speckled like a tiger's skin, and is sometimes brought to the colony, where it fetches a price of *5s. 9d.* per foot. At the first trial which our axes made on the iron-wood, a tree lying across the river, they rebounded. After a few blows the axe almost resembled a saw, and if we had not possessed some American axes we should have been obliged to drag the corials over land. As a strong contrast to the sweet-scented dipterix and the hard iron-wood, grew a tree superior in size to both, and when struck by the axe it diffused a most unpleasant smell: it was very soft and white, and the outer bark grey.

Jan. 8.—In lat. 4° 20′ N. we met with numerous boulders of granite of the same composition as those at Achramoucra, in the river Essequibo, in 4° 20′ N. lat., and at the cataracts of the river Corentyn, 4° 21′ N. lat.: the tract preserves, therefore, its east and west direction; the boulders were much rounded, often spherical, and gigantic in size.

Our pleasure at the open river did not last long: again it narrowed, and dwindled in width to about ten yards. The islets and palms of the former tract were wanting, but they were amply replaced by lianas, chiefly *mikania, convolvulaceæ,* and a spreading bush which might be called the mangrove of the fresh waters. Our progress was now connected with constant toil: with the most harassing labour, we scarcely made two miles in a day; and, in order to avoid cutting through trees which it would have taken us a day to accomplish, we preferred unloading the corials, and drawing them overland. I resolved now to halt every alternate day, and to send parties forward to clear our path. As if to render our progress to the south still slower, the river meandered in short turns, and the constant rain which had set in at the change of the moon had caused its banks to overflow. Five weeks had now elapsed since we had left the last human habitation, and, as we had not been able to increase our stock of provisions since, I was under the necessity of curtailing the allowance. The river had swollen rapidly, and game and fish were now scarce, while the difficulties increased with every step that we advanced. I

observed dissatisfaction among the crew; they were tired of proceeding further, and I had to use energetic measures to have my orders enforced.

While some of the Indians were hunting, they met a pack of wild dogs: our own dogs secured one, and, as Indians are generally fond of crossing their breed, Acouritch tied it to a tree, in order to take it with him when he returned from the chase; but the dog gnawed his rope, and was off before our prudent huntsman could execute his design. Hendrick, who had accompanied Acouritch, told me that the pack might have amounted to thirty, or more: in figure, he likened them to the bull-terrier—the ears rounded and hanging, the colour reddish brown. I was sorry that I lost the opportunity to see one of these animals, of which I had heard so much: they are sometimes met with near the coast, and always hunt in packs.

Jan. 22.—Our difficulties appeared to increase with every hour, and every step became more toilsome. The river is quite narrow, and winds its course through a wilderness, margined by prickly palms: it is almost entirely grown over by a species of solanum. We were now obliged to man one of the smaller corials with some of the ablest men, with cutlasses and axes in their hands, to clear the greatest obstacles out of the way, while we followed with the other corials, which were forced forward by long poles. We constantly came in contact with the bushes on either side, and were frequently molested by ants, centipedes, spiders, and scorpions, which secreted themselves in the rubbish left on the bushes by the last inundations, and inflicted the severest bites on us; or we received a brush over our face and hands by one of the prickly palm-leaves, which never failed to leave marks of its passage. The Indian crew fared worse in this respect: we were partly protected by our clothes, but their stock had given out long before this, and they had no protection whatever. The banks, originally low, were under water, in consequence of the continued rains, and it frequently proved difficult to find a place where we could sling our hammocks. It was late in the afternoon when we were still on the look-out to find a dry spot. We sent one of the Indians of the mixed race up a high tree: he gave us information that, so far as the eye could reach, the swamps continued—but sorry comfort for us weary travellers! Acouritch was hallooing most lustily, in order to try in what direction his voice resounded, to serve as an indication of dry land; but in vain. After sunset, and when we had made up our minds to remain in the corials, a small spot, which the water had not yet reached, was discovered. It rained heavily, and as the water was growing, we were glad when we could leave next morning, without having been dislodged and not fur-

ther molested, except that we had to wade to the place where we had landed on dry ground the previous evening.

Jan. 24.—I received this evening most unpleasant information. A Warrow Indian, who was rather a favourite, informed me that mischief was going on in the camp. For some days past I had discovered rebellious conduct, and had previously observed disobedience of orders; but they never showed it so openly as during the last two days. I was well aware that the generality of the Indians were disaffected to the further progress of the expedition, and I had even proof that the coloured people were equally to be distrusted. All endeavours to procure game or fish proved in vain; and the dreary prospect that, during the continuance of the rainy weather, no better success awaited us, had laid me under the necessity to reduce our daily allowance to little more than six ounces of rice for a man and five for a woman. I was now informed that the Caribs, with Acouritch at their head, had instigated the others to take the corials away, and to leave us during the night; and if we should show resistance, to tie us with hammock-ropes to the trees. I do not know how far Acouritch might have succeeded with the Arawaaks: however, I was aware that my own boat's crew, the Warrows, would not suffer their fidelity to be tampered with. The young Warrow was therefore sent to give me information. The intelligence of this treachery caused me great uneasiness: I did not know how far the disaffection might have spread, and I knew there was no individual in the camp who did not dislike proceeding farther. I informed Mr. Reiss of the circumstance, and we decided to be vigilant, and keep a strict guard upon the corials and ammunition. Acouritch must have had knowledge of his plot having been discovered. They had their camp that night not far from my tent. I saw their fires burning through the night, and was therefore not a little astonished to find, next morning, that they had deserted about midnight. We had heard the barking of one of our dogs at some distance from the camp. Mr. Reiss reconnoitred, but, discovering nothing unusual, he retired to his hammock: misled by the fires, he supposed the Caribs in their hammocks. They had taken with them some of our best cutlasses, iron pots, camp-kettles, &c. We found no traces of the direction they had taken, but I concluded that they might have attempted to reach the Corentyn by pursuing an eastern direction.* The forests, which we had passed during the latter week, were full of a species of mountain cabbage-tree: he might have therefore calculated that, as soon as he had cleared the swamps, they might partly live on it; and the seeds of another palm were then ripe, which the Arawaaks call *caria*, and the

* Both the rivers, Corentyn and Essequibo, are only fifteen miles distant from this point.—Ed.

Caribs *muro muro*, and of which the Indians are very fond. Though they might save themselves from starvation, the adventure was perilous enough, and proves the daring spirit of that tribe.

Our situation became more critical every day. We were now reduced to eleven effective men, which were to be distributed among four corials. I was still bent, however, on pushing onward.

Jan. 26.—In the course of the day we found the river widening like a lake, bordered by low bush and partly grown over with the beautiful *victoria*, the pride of my botanical discoveries, and which grew here so luxuriantly that some of the leaves measured six feet five inches in diameter. A species of *polygonum*, and numerous grasses of different tints, covered the river so completely, that only a small bright space, where the current was strongest, was left open. Alas, our joy did not last long! It narrowed, and we had again to cut through prickly palms and numerous prickly *solanums*, so rank in growth, that at times we had to drag the corial by main force over them.

Jan. 27.—I had not been able to procure any celestial observations since January 22nd, when I had found, by meridian altitude of the sun, that we were in 4° 1′ N. lat., consequently nearly in a parallel with the junction of the Rupununy and Essequibo. I determined, therefore, to advance for three days more, during which time I hoped to be able to make from six to ten miles southing, when it was my intention to encamp, and cross over by foot to the Essequibo. I communicated this resolution to my companions, and it spread quickly among the Indians, who received it with the greatest joy. At the back of the encampment our Indians had found many of the palms, previously mentioned, in seed, and they indulged freely, to indemnify themselves for past privation. The *caria* grows in bunches of from twelve to twenty inches in length, and nine to ten in diameter. Each nut is about an inch and a half long, round at the top, and pointed towards the end, where the fruit is sessile; the outer rind is provided with prickles; the kernel is eaten, and tastes, when young, somewhat like cocoa-nut: it is also roasted on the fire. The caudex is low; the leaves, or fronds, are provided with long prickles; and it is remarkable that I do not recollect having met with this palm previously, either in the Corentyn or the Essequibo. I think it is *Astrocaryon murce murce** (Mart.). We observed in the vicinity of our camp some

* I have frequently found the seeds of this palm on the low shores of the island Anegada, where it has been drifted by the current: it is vulgarly called Sea Cocoa-nut, though quite different from the Cocoa de Mar (*Lodoicea Sechellarum*). During inundations, the seeds are swept from the land, carried by the rivers to the estuaries, and there taken up by the currents.

gigantic conical ant-hills, ten feet in height, constructed of the soil, a mixture of sand and clay; the interior is built with particles of wood, leaves, and flowers; with the entrance from three to four inches in diameter, protected by dry leaves, cemented with clay and a glutinous substance. The ant is of a reddish-brown colour; the body from four to five-eighths of an inch in length, and it is called by the Arawaaks *haracorlie.*

The working ant, or labourer, has four prickly points on the back, and two on the head, and resembles much the Coushi ant (*Atta*), only being smaller.

Jan. 28.—We wound our way slowly through the meandering river, margined by prickly palms, and encroached upon by numerous *Marantaceæ*. Shortly after, passing a point, we found that the river gradually widened, and showed a fine sheet of water upwards of 150 yards broad: the river was similarly covered with those plants which I mentioned on another occasion: their number was, however, increased by a very pretty *Pontederia*, and another plant which was highly interesting to us in consequence of its leaves resembling the rare four-leaved clover, which is considered a lucky omen, according to popular belief, if picked up by accident, and not sought after. I saw neither blossoms nor seeds to become acquainted with the name.*

The stream preserved its width of about 150 yards for several miles, and I could almost fancy we had entered a different river: as this sudden expansion extended likewise to the east, where we issued from the underwood, we pursued its course in that direction for some miles, until we were arrested by thick wood, and found we were exploring an inlet only. We observed some granitic boulders in the river. The latitude observed at noon was 3° 58′ N.; our progress south, therefore, since January 22, had been scarcely three miles. Where the river narrowed again the current ran two knots: shortly after we were rejoiced to find it spreading to about thirty yards, and from its high banks on both sides we hoped it might so continue, and pushed on rapidly till evening, when I saw what I considered to be five or six land turtles, ranged on an old prostrated trunk on the river's left bank: such an opportunity for a good meal, in our straitened circumstances, was not to be neglected; we immediately halted, and on landing the Indians drew my attention to some bushes which had been recently cut with a knife: we now cautiously approached the hoped-for turtles, but to our mortification we found that they were only shells. We saw remains of former fires, and it was evident that I had found by accident the path which leads to the Essequibo. Some of the Indians discovered a raft of *mocco-*

* Marsilea quadrifolia, possibly.

moccos on the other side of the river, whence we concluded that the slaving expedition contemplated by the Caribs had been carried into execution shortly before our arrival; there were also symptoms of a prolonged encampment here.

Jan. 29.—The next day was the day of rest appointed to man; we remained, therefore, the more readily in our encampment, as circumstances had not always allowed us to rest on the Sabbath.

Jan. 30.—We started at nine o'clock by land in a S.W. direction to cross over to the Essequibo. Our party was Mr. Reiss, Cornelius, and five Indians to carry our hammocks and the necessary provisions. The path was barely twelve inches wide, marked by notches in the trees: numerous trees had fallen across it, and our limbs, cramped in the corials for the last two months, were very stiff. The soil was extremely fertile, and, generally speaking, the ground preserved the same level. We crossed several swamps in which the manicole palm grew most luxuriantly; I noticed likewise that strange species of palm, which I had seen on a former occasion in the Conocon mountains, *Geonoma* Spec.? called by the Arawaaks *Buba*: it here reaches a very great height, has but few leaves, and obtuse, as if they had been torn off at the end: single specimens of it are to be found near the coast, probably transplanted thither, but they are very scarce. After an hour's walk from our camp we passed a large tree with a smooth bark, called by the Caribs *Okheri-prúma*, in which several marks had been cut by Indians. The woods which we traversed consisted of magnificent trees; the soil, springy and of a rich vegetable mould mixed with sand, would produce anything. We saw the stately Crabwood tree (Aublet's *Carapa Guianensis*), the Souari (*Pekea tuberculosa* of Aublet), famed for its delicious nuts, which we only regretted were not then in season; the *Yaruri*, or paddle wood, which is curious, as its trunk appears as if it consisted of a number of slender trees grown together. The bark is dark-coloured, with a few light greyish spots; the seed is flat-shaped and rugose, and I conceive the tree to belong to the trumpet-flower tribe (*Bignoniaceæ*): the wood is very elastic, and, in consequence of the peculiar construction of its trunk, it is much esteemed by the Indians for paddles. I have frequently seen the Indians split one of the flutes off, and finish a paddle in the course of a few hours, having no other tool but a cutlass and common knife: it was then handed to the woman, who painted it with *Roucou* and *Lana*. We observed likewise the *Amara* or *Wamara** tree, of which the Indians make their war-clubs. The wood is very hard and dark-coloured. The *Wamara* is a species of *Lecythis*; its seed-capsules are shaped like an extinguisher: it is a large

* Bannia of the Arawaaks?

tree with a light-coloured bark. There were also many others which astonished us by their size, and of which the Indians make their corials and canoes. At an hour and a half distance we found rising ground, about forty feet high, assuming a N.W. and S.E. direction, and observed numerous rocks, from the size of a pigeon's egg to that of a large boulder: they were crystalline, weighty, and appeared to be inpregnated with iron. The soil, exposed by an uprooted tree, consisted of ochreous clay mixed with fragments of quartz, rounded by attrition, and of the same nature as those we had seen on the savannahs of the Pacaraima mountains.

Mr. Reiss, who followed with some of the Indians in the rear, had fallen in with a herd of kairounies and killed two, but as our men were already loaded, we could carry only one: we were about to continue our march, when we heard the report of a gun in the N.E.; a second followed, and a third. There could be no doubt that it was the preconcerted signal for our speedy return; only an urgent case would have induced Mr. Cameron to fire the signal: we therefore retraced our steps. I headed the party, and we had not far advanced, when I saw the herd of kairounies before us: they did not perceive me, and were in regular line of march, the young walking under the belly of the mother; we shot two more. As there was no time to be lost, they were cleaned and hung up in a tree, to be sent for in case circumstances permitted it. I and Solomon, one of my faithful Warrows, now took the vanguard. On the road numerous sinister causes for our recall suggested themselves to my mind, and in my anxiety I distanced all my party except my faithful Solomon. I heard the hum of voices, and cautioning the Indian to go softly, we listened. "They are Caribs," he whispered in my ear. I told him to hearken again—"Caribs," was again his reply. I stole somewhat nearer, and had a survey of a number of red hammocks. It is then true, thought I to myself, the camp has been surprised, Mr. Cameron and Mr. Vieth have been most likely murdered, or are perhaps lashed to the next tree, and your life is in their hands: what does it signify whether you lose it a few hours earlier or later? With this resolution I went forward, my pistol however cocked for the first assailant. As soon as I came up with them I asked, "Are you come as friends or as enemies?" I received no answer. My next inquiry was, "Who is your chieftain?" "Smittee (Smith); he is at Praneghierie's (the white man's) tent." I immediately proceeded there, and found my friend Smith, of Corentyn recollection, and the Copename chieftain, whom we met at the post Oreála, with Mr. Cameron, in conversation. All my apprehension melted like snow, and I ascertained now that the Macúsie expedition had in reality only arrived a few hours ago. When approaching the

Berbice, a musket had been fired by accident in our camp, and the Caribs supposing that some of their friends from the Rupununy were awaiting them, had set up a hue-and-cry, which had given Mr. Cameron the first notice of their approach. But what must have been their astonishment, when coming in sight of the river, they observed my corials? When I formerly reasoned with them at Oreála, on the injustice of enslaving Macúsies, and I found that it made no impression, I threatened them with the vengeance of the "Big Governor,"* and that I should be before them at this path which crosses the Berbice to the Essequibo. They smiled at my assertions, and considered it impossible. I had resolved, though alone, to use every means which policy allowed me to prevent them from executing their designs, but the difficulties which I met with while ascending the Berbice made me despair of reaching the path in time: fortunately, however, we accomplished it. In the course of the day we learned, that after Smith had returned from Skeldon, whither he accompanied me to receive payment, every preparation was made for the contemplated trip. Before they set out "Old Thomas" died, a *pi-ai* man of great renown; he had planned this expedition, and was to accompany it. He belonged to my crew when ascending the Corentyn, and when I attempted, whilst in Oreála, to persuade them not to undertake the slaving expedition, I found my intentions always counteracted by his interference and threats. He was greatly emaciated by a pulmonary complaint, at the time he left us in Skeldon: it was natural, therefore, to suppose that not many months would elapse before his death, and I told this to Smith before we parted. It had so happened as any one might have predicted: but upon the superstitious Indians it had great effect: they paused in their designs; long consultations were held, and they relinquished their original plan of the expedition; and having once hesitated and become apprehensive, they were now afraid to go even on a trading expedition without sending a deputation to the Macúsies to prepare the way. They had selected a Macúsie, named Sakurra, who had been brought up from childhood among them, and his two sons, for that purpose. Thus had the delay arisen, and favourable circumstances had assisted me; so that this prediction likewise proved true. Smith took the earliest opportunity, after I had arrived in the camp, to inform me that they had given up all idea of enslaving, and that they were merely going to barter for hammocks, cotton, dogs, &c. I was well aware of this, as soon as I had time to look about, from

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* The Indian is well aware of the different degrees of authority which are exercised by the post-holder, protector, fiscal or sheriff, and governor; and he connects with the name of "Big Governor" everything that is great, and commands obedience and respect.

the number of women and children in their party, which consisted of twenty-six men and two lads, six women and six children. If the Caribs undertake a warlike expedition, women and children are left behind. Smith, however, kept the reasons secret which had induced him to this change, and they were only ascertained by degrees at unguarded moments: of course I took the greatest advantage of the ascendency I had got over them by the truth of my prediction, that I should be before them at the path: it was a moment of pride and exultation, when I considered that I had been the means of saving many an innocent Indian from bondage, and from being torn from his family and country as a slave, which could not have been effected without a bloody contest; and the idea that I have been the indirect means of preventing it, recompenses me for my fatigues, and for the anxiety that I suffered, when I saw the difficulties of making any progress towards reaching the high mountain range by this road.

The Caribs were as short of provisions as ourselves: having been extravagant in the commencement, they now suffered from want; nor could we assist them.

According to their information, it was twelve days since they had left Tomatai. They had passed the Corentyn falls by hauling the corials overland to the left, behind the large cataract, called *Marisappa Yuma*, from whence they had reached, by water, the path which leads to the Berbice in two days and a half. Here they had hauled up their corials, to remain until their return, and had accomplished their journey from the Corentyn to the Berbice in two days and a half—an easy march. Most of them were painted with roncou and lana (*Tabuseba* in Caribbee). I observed a boy, who had painted on his limbs representations of some of the figures which we had observed cut in the rock *Timihrie*, and in some of the boulders near the great cataract.

Jan. 31.—We started early for the Essequibo. Much to my regret I had observed, that since we had been encamped the river had fallen ten inches: I determined, therefore, to return with all dispatch, as I was well aware, should it fall twelve inches more, we would have been blocked up until the rainy season should set in in the mountains, in March, while the middle of February was the best time to cross the lower cataracts, partly swollen by the rainy season of the coast regions. Should I find, on my return from the Essequibo, that the Berbice had not fallen materially, I contemplated a visit overland to the Corentyn.

Our line of march presented a strange sight; Indians with baskets, containing articles for barter, and large bundles of bows and arrows, women with children, or the brats astride the husbands' shoulders, some with luggage and provisions, and little girls, anxious to perform their part, each carrying a squalling puppy

in her arms. Thus we trod the path in Indian file. On arriving at the spot where we had left the kairounies, no bush hog was to be seen, but evident marks that it had been carried off by a tiger. On scouring the bush we discovered my Indian dog, Caniantho, stretched out dead, and a triangular wound on each side of the neck, made it probable that it had been killed by the same tiger which carried away the kairounies, and with which he had evidently fought: these were at length discovered: they had been dragged some distance from the place where we had hung them up, and laid side by side to serve for the animal's next night's repast. I regretted the dog very much, as he had shown much attachment to me, and being of the Macúsie breed, with all the marks of that variety, I bought him, with the intention of sending him, on my return, to the Zoological Gardens.

At half-past nine, A.M. we arrived at swampy ground, which I immediately recognized as that which had set bounds to our exploring tour from Primoss last year:* at that time we sunk to our knees in the mud; now it was almost dry. Shortly after we saw the first cocoa trees, and in fifteen minutes the broad Essequibo was before us, and we joyfully hailed the sight of an old acquaintance. We had walked from our camp at the Berbice to Primoss, on the eastern bank of the Essequibo, in 3h. 20m. I still found the hut which we had erected almost twelve months ago, and in which Mr. Brotherson and myself passed a most uncomfortable night, the rain falling in torrents. Mr. Reiss arrived shortly after: he was quite enthusiastic when he saw the fine broad Essequibo for the first time. As soon as the whole party came up, the Caribs made immediate preparations for leaving us, as they had now resolved to proceed to the abandoned settlement, Cumaka, three miles lower down. Mr. Reiss was anxious to see something more of the Essequibo, and was desirous to go with them as far as Cumaka: I considered it therefore best to keep Smith as hostage until his return in the afternoon. I had desired, when I left the camp, that a gun might be fired at six o'clock in the evening: we heard it quite distinctly; the direction was N. 55° E.; the direct distance 9 miles. In consequence of the unfavourable weather I had not brought any of my instruments except the compass. The position of Primoss, as deduced from observations at the mouth of the Rupununy, is in lat. 3° 50′ N. long. 57° 52′ W., while that of our camp on the river Berbice was in 3° 55½′ N., 57° 50¾′ W. The course S. 55 W.; distance 9 miles, gives 5 miles southing, and 7½ miles westing; the difference therefore in latitude is 3-10ths of a mile, whilst in longitude it is 6½ miles, which may arise from the longitude of the Essequibo being deduced by dead reckoning from lunar distances at Annay.†

* See Journal R. G. S., vol. vi. p. 269.

† The difference in longitude is trifling; and when we consider that the former

Feb. 1.—We left the Essequibo rather early, and after a walk of three hours and twenty minutes, entered our camp: as I know from experience that I walk three miles in an hour, the distance and windings of the path included is ten miles. The result of my crossing from the Berbice to the Essequibo will prove of importance to geography: the short period which is required to cross from river to river establishes most undeniably the course of the river Berbice much further to the westward than it is laid down in any of our maps. In Arrowsmith's late map of Columbia (London, 1834), the sources of the river Berbice are laid down in lat. 4° 30′ N.; long. 57° 14′ W., whereas by my observations, our camp was thirty-five miles to the southward, and as much to the westward of its assumed sources, and here the river was thirty-three yards wide, with a depth from eight to ten feet, and appeared to continue so as far as it was visited by us.

The next point of consequence is the non-existence of the river Demerara. Where I crossed, with the exception of a dry bed of a streamlet, which has its outlet a little beyond our camp, we did not see any appearance of even a brook between the Berbice and Essequibo. In all maps the sources of the river Demerara are placed in the 4th parallel of latitude, and about thirty miles south of those of the Berbice of the maps; but it is my opinion that it rises in the mountain chain between 4° 30′ and 4° 40′ N. We noticed, during our ascent, a small river fifteen yards wide, which emptied its black waters into the river Berbice in lat. 4° 21′ N., flowing from W. by S.; but of this we saw no trace. I estimate, by careful observation, the river Berbice at twenty feet lower in level in this parallel than the Essequibo. The barometer at our camp showed 333 feet above the sea; the cataracts on the Corentyn are considerably higher.

The soil between the two rivers appears to be particularly calculated for the cultivation of cocoa, and the flourishing condition of the plants we found near Primoss may be cited as proof.

On our return the river had fallen from eight to ten inches in the two days. This fact, added to the shortness of our provisions, —(we were now on five ounces of rice a day)—prevented my crossing to the river Corentyn. From information obtained from Smith, it appears that the ground is similar to that between the Berbice and Essequibo: there is only one small brook to cross,

position of Primoss was determined by dead reckoning, worked up from lunar distances at Annay to the west, and the latter by meridian distance carried from New Amsterdam, on the east, during two months, and up a series of cataracts, it may be considered as surprisingly accurate: the determination of the relative position of the two rivers Berbice and Essequibo at this point, by walking across the intervening land, is highly important. Mr. Scomburgk's indefatigable zeal in obtaining celestial observations whenever practicable must strike the most cursory reader of his Report, and his candour in honestly stating this slight discrepancy is well worthy of imitation by all travellers.—Ed.

and they had performed the distance in two days and a half; rather slow walking, as there were many children in their train; from which I conclude the distance is not more than twenty-four miles. There are, therefore, no difficulties in connecting the upper Essequibo with the Corentyn; an object which may be of importance to the colony. The navigation of the Corentyn, by flat-bottomed boats, offers less impediments, with the exception of the great cataracts, than the Essequibo.

We learn from M. de Humboldt ('*Relation Historique*') that Colonel Barata went from Para to Surinam with dispatches, in the year 1793:* there is no doubt that he descended the Rupununy, and reached the Corentyn by the path just mentioned. This path exists in the recollection of the oldest Caribs, who remember at the time of their youth, when the Essequibo and Corentyn were thickly inhabited, that a constant communication was kept up between the Caribs of the Pacaraima mountains and those of Surinam while the low swamps of the Berbice were only the abode of beasts of prey and noxious reptiles. We were probably the first who ever ascended the river Berbice, from its mouth to 3° 55′ N. latitude; and the difficulties connected with the undertaking will be remembered as long as our recollection lasts.

Feb. 2.—Commenced our return. As I had expected, we met the greatest difficulties: the water scarcely twelve inches deep.

Feb. 4.—It began to rain heavily, and by the 6th the river was considerably swollen, and we now made rapid progress on our descent.

Feb. 7.—We passed Blackwater river, falling in from the west, just a month after we had seen it for the first time.

Nothing of interest occurred. Even the animal creation seemed to conceal themselves during the tropical torrents. Occasionally a carara (*plotus* Spec.) was seen to follow the river's course, stretching its long neck at the unusual appearance of our corials. It is a drowsy bird, and after its meal it takes its siesta. One that was sleeping on the branch of a tree overhanging the river, suddenly woke by the noise of our paddles, tried to dart into the water, but fell into our corial and was captured. When surprised, the darter does not seek its security in flight, but precipitates itself into the water and dives: the peculiar formation of its nasal organs allows this bird to remain ten minutes under water. The bird is from two feet six inches to three feet long; a sharp-pointed beak, and its neck is so pliable in consequence of an additional joint, that it can contract it like the body of a serpent. It kept our dogs at bay.

Feb. 9.—We arrived at the uppermost of that series of falls,

* See also MS. of Padre Sousa, of Barra, in Journal R. G. S., vol. vi. p. 16.

which, for want of an Indian name, we had called the Christmas Cataracts. The corial we had left was no longer to be seen, and the heads of the kaymans, which we had deposited till our return, had the large teeth broken out: as to these the Caribs, and almost all Indians, ascribe talismanic powers, there could be little doubt that Acouritch and the Caribs had been the thieves in both cases. In consequence of the river having swollen, the rocks, which we found bare on our ascent, were now chiefly covered, and the falls, in consequence of the increased volume of water, more powerful. Nevertheless Cornelius thought he might venture to shoot them; and as I knew that he had great experience in these matters, I did not contradict his opinion. I took, however, the precaution to remove the chronometer and all my instruments, and it was fortunate that I did so, as the heavy surge at the cataract almost filled the corial, and it was with difficulty that she could be floated to the next island. The other corials were brought by a more laborious but safer road to the foot of the first fall. In order to pass the others, I directed the corials to be unloaded, and the baggage to be carried over land, while we were still obliged to hazard our corials. It is an exciting scene to see the corial, when once in the current, shooting along with the swiftness of lightning: she arrives at the edge of the cataract, and balancing for a moment, she plunges headlong into the surge below, dashing the spray on either side against the rocks that bound the passage; then rises, and is carried forward by the increased velocity of the current. The large corial which carried our provisions was thus on the point of shooting the fall, and Mr. Reiss and myself went to the foot of the cataract to watch her progress. The river makes a sudden bend, and the stream descends obliquely; we therefore scarcely saw the corial coming round the point when she was already in the current, and flew towards the fall: the steersman and bowman apparently not acting in concert, she shot towards the rocks, and when we expected that she would strike and be dashed to pieces, the back-water from the rocks drove her off, and she escaped unharmed. The descent of the corial became the subject of a prolonged conversation between Mr. Reiss and myself, and I expressed a wish that my corial, which was by far the most expensive, should not be hazarded, if there was any other method of lowering it.

We were now within five days' journey from the first settlement. While in course of conversation to-day, after our scanty meal, we were rather surprised when Mr. Reiss indulged in a melancholy strain, and observed, "he knew he should die young." We ridiculed the idea. As the sky was more favourable than usual, in the evening I went out, in order to observe the meridian altitude of Canopus, in which I was assisted by Mr. Reiss.

Feb. 12.—Cornelius reported this morning that he had inspected the cataract, and he thought it impossible that the corial could be lowered down by ropes, since the rocks did not afford footing to the Indians. Mr. Reiss, who was standing next to me, thought I was too apprehensive; and he considered there was less danger for my corial, than for the one which descended the preceding morning. The corial was therefore to shoot the cataract, and I saw that the necessary arrangements were made for her descent. I was much surprised when Mr. Reiss expressed his intention to go in the corial, in order to see better how she would go down. I remonstrated with him, as he was not an experienced swimmer; and, being called away by some other business, I thought it was a mere whim, which would be given up on further reflection. I was yet in conversation with Mr. Vieth, when information was brought to me that the corial was just on the point of starting. I proceeded directly to the foot of the cataract: when the corial hove in sight, the first object that struck me was Mr. Reiss, standing on one of the thwarts in the corial, when prudence would have dictated that he should sit down. From that moment to the catastrophe not two seconds elapsed. Intending to avoid the danger of yesterday, they descended at a different point, where the fall was more precipitous. The shock, when her bow struck the surge, caused Mr. Reiss to lose his balance: in falling, he grasped one of the iron staunchions of the awning. The corial was upset, and, in the next moment, her inmates, thirteen in number, were seen struggling with the current, and, unable to stem it, were carried with rapidity towards the next cataract. My eyes were fixed on poor Reiss: he kept himself above water but a short time, sunk, and re-appeared; and, when I had hopes that he might reach one of the rocks, the current of the next rapid seized him, and I fear he came in contact with a sunken rock: he was turned completely round, and sunk in the whirlpool at the foot of the rapid. His cap was taken up by the first Indian (old Mathias) who was able to stem the current, and attempted to swim to his assistance: he mistook the cap for poor Reiss. Immediately that I was able to muster men enough to guide a corial, we commenced a most diligent search, in which we were assisted by some who had, meanwhile, manned a second corial. For the two next hours all our endeavours were fruitless. At length we found his body in a direction where we least expected it, and where an under current must have drifted it. Life was extinct; nevertheless; the usual means for recovering drowned persons were resorted to, but in vain.

It now became my painful duty to make arrangements for depositing the remains of our poor companion in their last home. During the evening I selected for that purpose a sequestered spot,

opposite to the place where he was drowned, on a rising ground which the water, even when at its highest, during inundations, does not reach. Two aged trees here stand on the western bank of the river, whence I desired a path to be cleared for his future resting-place.

Feb. 13.—This morning we carried our poor friend to his grave. In the absence of a coffin, we wrapped him in his hammock as a shroud; and after he had been put into the corial, by the upsetting of which he lost his life, we conveyed him to the opposite shore, and from thence he was carried, by the young men who professed Christianity, to the level spot on the hill which we had prepared for his resting-place; and while I read the expressive and beautiful service for the burial of the dead, there was not an eye dry of those who call themselves Christians; and even the Indians, decently apparelled, stood with downcast eyes round his grave, and over many a rude cheek stole a tear. On a level ground, round which mora-trees and palms,—the latter an emblem of the Christian faith,—form an almost perfect circle, there now rises a pile of stones, under which rests our lamented companion to await his Maker's call. A small tablet which he himself brought, in order to engrave his name, and to leave it as a remembrance in case we should reach the Acaray mountains, now bears this inscription:—

Drowned,
12th Feb., 1837,
CHARLES F. REISS,
Aged 22 years.

and is firmly fixed to one of the trees that form the circle.

Feb. 15.—With what feelings we left our camp and continued our journey this morning may be imagined. The falls and rapids we had to pass were very numerous: I think there are forty-eight to the Chrismas Cataracts; and it was a sore trial to our crew, in their present enfeebled and dejected state, with the remembrance of our recent accident and loss. We did not pass some of the larger cataracts without getting the corials filled with water, and we had twice to unload in order to bale. We halted at noon, at the foot of the hills, in 4° 46½′ N., which apparently are the highest adjacent to the Berbice; and I made a series of hourly observations on the barometer, as data for computing the height of the hills and of the river; that of the latter proved to be 160 feet above the level of the sea.

Feb. 16.—Accompanied by some Indians, I left this morning early, to ascend the hills in the south-west. Our path led for some time along the river upwards, until it turned northerly over

undulating ground. I never saw so great a variety of ferns assembled in such a small area as I found here, amounting to upwards of fifteen species, some very interesting. We repeatedly crossed a mountain-stream, which meandered through the gradually-rising ground, forming miniature glens. Half an hour's walk brought us to the foot of the eastern hill, which assumes the form of a cone. In ascending we found many large fragments of rock, containing pieces of rounded quartz, until the peak rises abruptly. We scrambled with difficulty to the summit. The sky was clouded, and a thick fog hovered over the wooded valley; the view was, besides, obstructed by gigantic trees; and though I had mounted one of the boulders, I could not succeed in getting any extensive view. The barometer gave the height of this peak 828 feet above the level of the sea. A higher peak bore from hence N. 25° W.: in order to reach it, we continued along the ridge for about a mile and a half, when we stood on the highest point of the mountains. A chance gleam of the sun occasionally made its way through the thick coat of clouds, and a strong easterly wind dispersed the fog. This peak formed the north-western angle of the valley, and afforded me a fine view over extensive wood-land towards the south-east. The next highest peak bore north, about one mile distant, and was the hill I measured while at the Cataract Itabrú. The valleys run in the direction of the range of hills, whose sides are generally covered with lofty trees, and their heights formed by broken pieces of rocks, or perpendicular walls. Many of the rocks appeared of marl, and I was much surprised to find the ridge, as well as the sides of the hills, covered with angular and rounded quartz—pebbles similar to those which I had seen previously at the savannahs of the Pacaraima, at the Carib path, at the Christmas Cataract, and now on the top of the highest hill of the River Berbice, as far as I have visited it. The boulders which we found in such large quantities on the sides of the south-eastern peak contained fragments of quartz, sometimes several inches in diameter, which showed traces of transportation or of long-continued friction.

I remained above two hours on this spot. The barometer showed that this peak, which, as before mentioned, I called Parish's Peak, was 910 feet above the level of the sea, and 775 feet above the River Berbice, which meanders at its foot. After having engraved on the bark of a tree "Parish's Peak," as a memento of my excursion, I retraced my steps, and pondering whether it was probable that this peak had been visited before by a human being, I missed my way, and had some difficulty in rejoining the party at the foot of the hill. Mr. Veith, the same evening, who had wandered in search of plants, could not find his way back till we, alarmed for his safety, fired guns every

quarter of an hour, which directed him to the camp about nine o'clock.

The fitness of this hilly tract for the cultivation of coffee, and, from its gravelly and clayey nature, for the cultivation of the vine and olive, is remarkable. The springy soil in the valleys would produce almost anything, but the sides of the hills are particularly adapted for the production of grapes without much labour or expense. What an area might here be claimed from nature, and made subservient to the wants of man!

This range of hills, which is connected with the Twasinkie and Pacaraima mountains, I am disposed to consider as the old boundary of the Atlantic; the geological features might lead to such a supposition. A little farther north commence the hillocks of sand, which may be presumed as the consequence of a receding sea.

In lowering one of the corials down the gulf, the rope snapped, and the boat was split against the rocks; we were therefore, with great labour, obliged to transport the other over the hill.

Feb. 17.—We arrived, in the afternoon, at the Cataract Itabrú.

Feb. 19.—All our arrangements were completed by twelve o'clock to-day, and we left the last cataract where danger might be apprehended under great demonstrations of joy from our Indians, who appeared to have received additional strength in their sinews to propel the corials.

Feb. 20.—We arrived this morning at the Waccaway settlement, the first human abode we had seen since we left it, two months since, accompanied by the Chieftain Andres and his men, who, it may be recollected, deserted us while ascending the Christmas Cataracts. As might be expected, none of those who deserted us were found at the settlement, which may be considered a half-way house between the colony and the falls. There are always strange Indians to be met here; the vicinity of the upper path from the Berbice to the Demerara makes it convenient as a resting-place. On the present occasion we found Waccaways and Macúsies, who had been working for some months for one of the wood-cutters: as fruits of their labours, each had a gun and some pieces of calico, which were ostentatiously exhibited; and they appeared not to have the slightest mistrust of us, as they left the hut several times without concealing their property, though our whole crew were strangers to them.

On rounding a point of the river, in the vicinity of a newly-settled piece of ground, I saw some woodskins, with Indians, approaching; but scarcely had they observed my corial, when they paddled with all their might to the shore, and jumped out, leaving the woodskins and their cargo to their fate. I conjectured that they were some of the runnaway Waccaways. One

of the woodskins, with two women, paddled towards the settlement; the younger one, after having landed, ran with the swiftness of a gazelle towards the woods. We recognized Andres' wife. He himself must have been in the woodskin: we saw his gun and shot-belt in it. Since I had not succeeded in apprehending him, I did not feel any desire to hunt after the others, or to frighten the women: we therefore continued our journey.

Feb. 21.—At noon we arrived at Moracco, at Mr. M'Cullum's, where we were received with the same hospitality we had experienced during our ascent of the river. Everything needful was provided, and my poor Indians, after six weeks' scarcity and deprivation, were once more allowed to indulge in the luxury of an urestricted meal.

Many of them were very much swollen, while others, and we among them, were so attenuated, that our acquaintances broke out in a cry of surprise; yet, though we had suffered much, all might have been forgotten had we not had to bewail the untimely death of Mr. Reiss.

On our return to Wickie I found that the weather was more favourable in the coast regions than the advanced season would have led me to expect. I resolved therefore to undertake a tour to the river Demerara, partly by means of the *Wieronie*, a tributary of the Berbice, and partly by land over the savannahs.

Feb. 27.—We started from Wickie and descended the river as far as Peereboom, the residence of Mr. Duggin, who showed us every attention and civility. This gentleman has a wood-cutting establishment on the Wieronie, and as I proposed to ascend the river as far as I could, to judge of its fitness for navigation by punts and other river craft, I thankfully accepted his offer of a letter to his superintendent, to give me Moses, an Arawaak chief, as a guide across the savannahs, should I find the navigation too intricate to proceed.

Feb. 28.—We arrived at the mouth of the Wieronie, which joins the Berbice from the north-west, at a point where the river, flowing to the north, takes an abrupt turn to the south-east, and expands considerably. The waters of the Wieronie are very black, but perfectly clear; its width is about fifty yards, its depth twenty-seven feet. At its eastern angle of junction there was formerly a redoubt and a reformed church, of which the remains are to be seen. The minister's house was on the river's opposite side. We found the current very strong, and, as the river is influenced by the tides, the ebb obliged us to come-to. There were formerly several plantations along the banks of the river, and we observed the remnants of a wharf, trenches, &c.; and the soil appeared to be very fertile. The river meanders, and keeps

an average depth of eighteen feet. The savannahs frequently approach the river; at other times its banks are margined with trees and bush. From a small hillock on the right I had an extensive view over the savannahs, which stretch to the rivers *Maiconie* and *Mahaica*, and a lively intercourse is carried on between the Indians of these rivers across the savannahs.

March 1.—The scenery of the river became very interesting: it expanded occasionally like the Upper Berbice, but its lake-like expansions were generally encompassed by higher land, and studded with little islands, on which were numbers of the majestic eta tree. Its lofty stem supports numerous fan-shaped leaves, and a gigantic cluster of almost round seeds about two inches and a half in diameter, and marked like the cone of a pine.

A path leads from one of these inlets, called *Catacabura*, across the savannahs to the river Demerara, but as I had no guide I preferred to proceed to Yucabura, 9 miles farther north, in order to obtain the promised guide. The river becomes shallow wherever it expands; and though it is scarcely in such places more than from four to five feet deep, punts loaded with wood navigate it freely. I found that it would be advisable to leave the corial here, and to proceed on foot over the savannahs.

March 2.—With Moses as guide, we commenced our pedestrian excursion. He was accompanied by his wife, a young Arawaak, not half his age, whom he burdened with his share of the baggage. We followed, for about three miles, the river's course from the south-west, through woods which border its banks. The rich vegetable soil was here several feet in depth, and elastic to the step. On issuing from the wood we entered a tract of bushes about twelve feet in height, which, to one unacquainted with the vegetation of these tracts, would cause surprise at its luxuriance in a loose sandy soil, as white and sterile apparently as the sand of the sea-shore. The fact is, that in digging it will be found that the sand is mixed at a certain depth with rich mould. Nevertheless the Flora is quite peculiar, and the flowers of these bushes distinguished by their fragrance. The Arawaak Indian names these spots of undergrowth *Moro.* They are the transition from the wood to the naked savannah, which we entered shortly after. I was here agreeably surprised to see the savannah alternate with woodland and hillocks; the prospect was therefore by no means so monotonous as in the savannahs of the Pacaraima mountains. Passed a small brook, called the Catchie-cabura, which meanders as a sprightly streamlet in a north-west direction through the wood towards the Wieronie. After we had refreshed ourselves we continued our journey, exchanging the hot savannah for the shady forest. The eye was never wearied by monotony; occasionally it swept over the plain

to the dense forest which bounded the prospect to the west, or it was arrested by a ridge of coppice wood, over which towered the eta, with its fan-shaped head, and marked the track of a rivulet. On our right the course of the Wieronie was distinctly indicated by the number of eta trees. At four o'clock in the afternoon it was not more than a mile from us, and I profited by the opportunity to ascertain its course by compass bearings. On the edge of a wood we passed some huts abandoned, as we were told, on account of the murder of an Indian in a quarrel.

After a march of twenty-four miles we halted for the night at some huts tenantless except by chigoes, which swarmed. A meridian altitude of Canopus gave me 5° 40′ 30″ N. as our latitude.

March 3.—At an early hour we crossed the brook *Aroma*, which flowed to the W.N.W., through a narrow glen about forty feet deep, apparently effected by the gradual action of the stream. This was also characteristic of all the running waters we passed here. On emerging from a wood we saw some Indian huts before us—they were abandoned; our guide recollected however the former provision fields, and off started the whole train to cut sugar canes. After nearly an hour's delay they returned almost loaded with canes and pine apples. Our march continued across savannahs and through woods. At ten we arrived at the brook *Yawarie*, with light brown water. It here flows north and joins the Wieronie about half a mile from the place where we crossed the former. We ascended a hill of about sixty feet in height, and continued our march along its brow for two miles, in a south-west direction; at its western base flows the Wieronie. On descending we had to wade through a swamp before we reached that river, which here was almost darker than at its mouth, but scarcely more than eight yards wide and nine feet deep, with a strong current. Arrived at the opposite bank, we had again to wade through a swamp: we often sunk up to our waist in the mud, and were really rejoiced when we reached rising ground. We stopped at five P.M., fatigued by our march, and drenched by torrents of rain, at the edge of a wood, where were some temporary huts a few steps from the brook *Elissa*, also flowing to the northward.

March 4.—We resumed our course through the woods: it was now mostly west; the stream *Wannoka*, with black waters, was almost as large as the Wieronie, where we crossed it. The soil chiefly fertile woodland; the trees consisted of tedermas, wamara, kakerally, manaribally, kakerabally, pourouch, or bullet-tree, &c. &c. The weather was not more favourable than the preceding day, and several swamps which we had to cross by no means assisted to make our journey agreeable. It is difficult walking through one of these swamps; they are generally overgrown with

the manicole palm, and as soon as some substantial soil has collected around their base that graceful tree appears to rise from a hillock. If the traveller succeed in stepping from one of these hillocks to the next he is sure to sink not much above his ancles in the black mud; but, should he miss his mark, he may prepare himself to sink to his waist in the boggy ground, whence he rises, not as a swan, unless it be like that once *rara avis*, the black swan. We passed several brooks flowing to the north, very likely tributaries to the *Maiconie* and *Mahaica*, on the sea coast. At one o'clock, having previously followed the ridge of a hillock about fifty feet high, we descended and crossed the *Alissaro*, a brook with white water, and the first which flows in a southern direction, or contrary to those we had previously passed. We again ascended a steep hillock, higher than any we had hitherto seen (perhaps eighty feet), then crossed two streamlets, also flowing to the southward, and came upon the vestiges of a former timber path.*

An hour afterwards we passed some new fields, planted with cassada, pumpkins, and other necessaries for the sustenance of the Indian. The path descended from here gradually, but I should say that these fields were upwards of 200 feet above the Demerara river. On issuing from the wood we were at an abandoned settlement, and in sight of the river Demerara, which we hailed with delight. It is here dark coloured, and very different in appearance from the muddy river it presents at George Town. We reached its banks at a place called Ajackwa, and then followed its course northward for about a mile and a half, and arrived at 3. 45, at the Post Seba, where Mr. Spencer, the postholder, gave us a most hearty welcome.

We crossed the Wieronie in lat. 5° 39½′ and long. 58° 3′ W., from whence it appeared to take a far southern direction; the direct distance from that point to the river Demerara is therefore about 21½ miles; † and there is no doubt in my mind that the

* Wooden rollers, laid down at certain distances, to facilitate the transport of timber to the river.

† The direct distance between the rivers Berbice and Demerara, that is from the junction of the Wieronie and Berbice to the Post Seba on the Demerara, almost in the same parallel of latitude, is about fifty-two miles, viz.—thirty to the point where the Indian path crosses the Wieronie, and twenty-two thence to the Demerara. The former part may be likened to the string of a bow, or the chord of an arc of sixty miles, described by the river Wieronie meandering to the northward through the savannahs; and to judge from its numerous sweeps, inlets, and occasional swamps, the rise of the ground between these two rivers can be very trifling. The cause of its rapid current must be looked for nearer its source in the south. From the Wieronie to the westward the ground appears to rise till within about seven miles of the river Demerara, where, judging from the opposite course, (north and south) of the streamlets (whose outlets we do not know, unless they reach the coast), it may be presumed is the watershed or line of separation of waters flowing to the Demerara and the Berbice. It is possible that this line may be only a few miles to the westward of the spot where the Wieronie was crossed, but it is not easy to discover. Yet this is not the highest ground between the two rivers, which appears to reach 200 feet at the distance

Wieronie is ample enough to be rendered navigable for canoes and punts to the point where we crossed it: the trees which have fallen across it need only to be removed to make it already navigable for corials and light canoes. The whole distance which we had walked, according to the circuitous road which we had been led from the brook Yucabura, amounted to fifty miles. The savannahs which we had traversed are plentifully watered by beautiful streams, tributaries to the Wieronie and Berbice, and abound in wholesome and nutritious grasses. They are therefore particularly qualified for the grazing ground of many thousand heads of cattle and horses. The favourable circumstance that these savannahs are so well watered and interspersed by woodland, to afford shade, enhances their value, and if an experiment is required whether the grass be wholesome, we need only to refer to Mr. Duggin, who has lately begun to raise cattle, and is highly satisfied with the results.

It was my intention, when circumstances would permit it, to pay a visit to the great fall of the river Demerara. I had heard much of it, and was anxious to make a comparison with those I had passed in the Essequibo, Corentyn, and Berbice. The weather was unfavourable, but this did not prevent me executing my design. Through the kindness of Mr. Hebberd, I was provided with a batteau, or built canoe, and I left the morning after my arrival at Seba. I was fortunate enough to procure the great Arawaak chief Simon, as a guide, and he performed most faithfully and attentively his duty. A relation of this excursion is beyond the limits of this report; suffice it to say, we arrived on the 7th of March at the great fall, and I lost no time visiting it next morning. I was disappointed; it has neither the grandeur nor the volume of water of William the Fourth's Cataract on the Essequibo, and can by no means measure itself with Smyth's Cataract in the Corentyn. With regard to the difficulties which it might have opposed to me, in case I wished to pass it with my corials, I can certify that I should not have hesitated a moment to transport baggage and corials over, and with less trouble, than at the Cataract Itabrú. At the great fall (as it is called, *par excellence*) of the Demerara, the road has been cleared and the neces-

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of only a mile and a half from the eastern bank of the Demerara. Thus the Berbice forms the natural drain of a country extending thirty-five or perhaps forty-five miles to the westward, and upwards of thirty miles (by the Wickie) to the eastward, or nearly to the banks of the great river Corentyn and to the Demerara, neither of which, during this part of its course, receives a tributary of any importance. What a noble tract of fertile country do these savannahs offer to the colonist; land rich in all the luxuriance of a virgin soil and a tropical sun, and offering every facility of communication that can be desired! It may be noticed that the shortest distance hereabouts between the Demerara and Berbice would be an E.S.E. line from the Post Seba to the western bend of the Berbice, below the junction of the river Wickie, about forty-seven miles, and this line continued for forty-seven miles further would cut the river Corentyn close to the post of Oreála.—Ed.

sary rollers are laid by Indians, who have transported their corials and woodskins over; while in every instance where such a transsport became necessary in the river Berbice we had to make the preparations ourselves; and with regard to our difficulties at the Christmas Cataracts, they far, far out-balanced those which the great fall could have opposed to us.

Among the Indians of the upper river Demerara the greatest scarcity was prevailing: in consequence of severe rains the cassada roots rotted in the ground, and, in order to secure themselves against starvation, they had to resort to the seeds of the greenheart tree, which contains a substance as bitter as quinine. The seeds were grated and put in fresh water, and a matter precipitates similar in appearance to starch: it is repeatedly washed to lessen its bitterness, which it never loses entirely: it is then mixed with rotten wood pounded previously and sifted, and those who have it in their power, mix a little cassada flour to it. This substitute for bread is not only quite black but as bitter as wormwood, and cannot be wholesome.

We returned now to Seba, which we left on the 7th of March, after having rested a day. We retraced our steps towards the Wieronie; but after we had crossed that river we took a different path, to pay our promised visit to the Indian settlement, and to buy cassada bread. The settlement was larger than the generality of the Arawaak villages I had seen along the river Berbice. It might consist of about sixty people in ten huts. After the Indians in my train had taken place, the chief of the settlement came forward and said three short sentences to him whom he considered the first among my crew. Those sentences expressed, in an increased ratio, his welcome, and are, literally translated, "Sit down, sit well down, sit very well down." The man thus addressed, said to each sentence, "*wang;*" "I thank you." He went then to the next guest, and so in rotation, until all had received his welcome. Then came his sons and all the men of the settlement, one by one, and repeated the same. The whole ceremony lasted upwards of half an hour: I was excluded from the welcome. As soon as we had procured the supply of bread we left the settlement, accompanied by two young men which I had hired to carry it to the banks of the Wieronie. We slept that night in an open savannah, drenched by the rain, and arrived in a similar state next day (March 13) at Yucabura, where we had left our corials: tedious as our ascent of the Wieronie had been, the current now bore us along at a rapid rate, and we made in seven hours thirty-four miles. On our ascent we had found the current to run from four to five knots. We landed on the 15th at Wickie, where we found those whom we had left behind in perfect health and all recovered from their late fatigues and deprivations.

One other pedestrian excursion offered itself; I was anxious to

visit the Corentyn by means of the Wickie and Canje; and as many of my Indians, from Oreála and its neighbourhood, had their wives and children with them, which it would have proved inconvenient to take to New Amsterdam, I resolved to accompany the supernumeraries to their home: this would at the same time enable them to send corials on their arrival for their husbands, to the mouth of the Corentyn, to await their return. We entered, therefore, the river Wickie on the 20th, where it is about forty yards wide and twelve feet deep, and continued upwards in a S.E. direction: its waters are whitish and turbulent; in other respects it resembles much the Wieronie, as well with regard to scenery as in soil. Numerous orchideous plants were seen attached to the branches of trees, which overhung the river; and the curious *Coryanthus*, the yellow *Oncidium Gongora*, and others, were in blossom, and distributed a delightful fragrance. One was remarkable, in consequence of its growing on the lofty stem of the eta palms, and its narrow pendulous leaves were from six to seven feet long.

We arrived at half-past four in the afternoon at the brook Pototo, which joins from the N.E., and whose course we followed, as we understood that a short distance from its embouchure some Arawaaks were living. The Pototo resembles an Itabú (the Arawaak term for the lake-like expansions of their rivers). It spreads about 400 to 500 yards, and is partly covered with rushes and other water plants.

We ascended the river for about twenty minutes, when we halted at the landing-place of the Arawaak settlement on the eastern bank, and shortly after received a visit from some of the men: they were very friendly, and informed us that the nearest path led from their settlement to the Canje and Corentyn: there was another higher up, but it was not more frequented, as the Indians who lived there formerly had removed. I resolved, therefore, to engage one as guide to accompany us next morning.

March 21.—I was astonished to see with what burdens the women, who were now returning to their home, had loaded themselves. They had carried on a lively barter with such articles as they had received from me in part of their payment, and calculated on a second profit on those which they had procured in return. The savannahs which we traversed resembled those between the Wieronie and Demerara. They appeared to be more wooded, and possessed more slopes. After crossing the stream *Turi-cabura*, we ascended a hillock about eighty feet high, whence was a beautiful view. We crossed a brook with a rapid current and black water, and on emerging from the wood found ourselves on the border of an extensive swamp, on the other side of which we observed several Indian huts. It was provoking to find that we must cross the swamp, rendered so much the more difficult, owing to the rushes and grasses having been lately burnt to

the ground. Here were only four huts: we bought half an *Apuje*, or lesser Peccary, which the owner had just shot.

March 22.—Continued our route. An hour's walk through the dense wood, abounding in useful timber trees, chiefly bullet-wood and wallaba, brought us to the small settlement of Arawaaks on the bank of the river Canje; it had been only lately established. We found the chief occupied in making baskets from the slender branches of a species of Bignonia: when he rose he presented a frightful picture from dropsy. He, however, offered his services to accompany us to the Corentyn, as he was well acquainted with the track. Unfortunately my plan of accompanying the Indians thither was frustrated by a severe attack of rheumatism.

The Canje is here about thirty-five yards wide, the water dark-coloured, and its current rapid, perhaps about three miles and a half an hour. The party of Indians embarked next morning in three small corials. Their voyage to the mouth of the brook *Ikuruwa*, where the post-holder of the Canje has his residence, is accomplished in one day: they follow the course of the Ikuruwa upwards to the Brae, or broad water, a small lake through which the Ikuruwa flows, and from thence the path leads over savannahs to Oreála, the distance being about twelve miles.*

With great exertions I returned to the settlement of Pototo next day, and the following day to Wickie, which we ultimately left on March 25. It was Easter-eve, and on our arrival we found Mr. Duggin's house filled with Indians, who, dressed in their best attire, amused themselves in dancing. What a display of beads of all sizes and colours! The men had all new *Camisaros*, or *Hiatos*, fringed with different coloured cotton hangings; and divers figures cut out of white linen, intended to represent tigers, &c., were fixed to the caps. Their chief, Jandje, was one of the mixed race, who formerly possessed the greatest influence over the Indians in his neighbourhood; he could at a short notice assemble from 200 to 300 armed Indians, and his will was undisputed law. He used to drill his Indians regularly: he himself, on occasions where a display was to take place, appeared, dressed out in a costly uniform, with sword in hand; a present, I understood, from the late Governor Baird. His power was arbitrary, and he alone settled every dispute on the spot: the culprit was generally tied to a tree and soundly flogged. However, he protected the Indians against the imposition of the settlers who employed them, and thus preserved his sway. He himself worked very hard, but naturally for high wages, which were gladly given to him, in order to secure his influence in procuring Indian labourers. Since the

* The direct distance from Wickie, on the Berbice, to this point of the Canje, is about twenty-two miles. The Canje hence pursues its course to the northward, and falls into the Berbice immediately to the north of New Amsterdam.—Ed.

colony has stopped the presents, which were formerly given to the Indians, he has retired, and contents himself with superintending the affairs of his own relations, and those who are under him, at his settlement, which, for neatness and comfort, surpasses any I have ever seen before, and vies with that of many of the settlers. In his own settlement he acts as supreme; nothing must be done without his knowledge and consent. He is noted for his gallantry, and indulges in polygamy like the rest of his tribe. He has lately taken unto himself a young bride, distinguished for her Indian charms, and who on the present occasion was dressed as a European: she was certainly handsome; the chief kept a strict watch over her. His feats of valour and villainy, when intent on re-stocking his harem, are the topics of conversation for the country.

March 28.—We bade adieu to Mr. Duggin; and having selected a guide among Jandje's subjects, to inform me of the names of streams and waters in our descent of the Berbice from the Wieronie to the coast, we set out, our progress being regulated by the tides. I was anxious to procure as accurate a survey of the lower river Berbice as circumstances and time would permit me. I used with great advantage the well-known method of surveying by measuring distances by sound, which, by comparison, I found sufficiently accurate, and I have thus procured a number of data which, checked by astronomical observations, may prove useful for the construction of a topographical map of the river on a large scale.

On our descent we visited the site of the old Fort Nassau and Old Amsterdam, the former capital of Berbice: the streets of the latter are yet to be traced by brick pavements: there is little to be seen of the fortifications, which are covered with bush and grass, and we did not feel very anxious to enter into a close investigation, as we had been warned to beware of *Labari*, and other poisonous snakes, which frequent the old walls. As a monument of its former wealth, a single dwelling of a rich proprietor rises alone out of the present surrounding wilderness—ere long itself to be numbered among the ruins around. The glazed and richly-ornamented windows are shattered in, and the name of *Buse*, which in ornamental letters and flourishes decorates the entrance, will doubtless soon be obliterated.

March 30.—At the plantation *Mara*, on the river's right, or eastern bank, I measured a base-line to determine the width, and found it 836 yards wide at about twenty-three miles from the sea; its average depth from three to four fathoms; the current four knots an hour. We reached the plantation Rossfield, on the left bank, that night, and were most hospitably received by Mr. Mackenzie: it is in lat. 6° 10′ N. long. 57° 26½′ W.

March 31.—After an absence of four months and several days, we arrived this afternoon at New Amsterdam. The crowd of

feelings which oppressed my heart at my return were very different from those with which I set out. On reviewing the events which had occurred since the bow of my corial was turned in the contrary direction—not to mention the rainy weather, want of provisions, and the physical obstacles that opposed our further progress—I could not but feel that we were returning without one of our companions; and however conscious that on all occasions I had fully done my duty, and exerted myself to the utmost, still the remembrance of the loss of one who had shared all our perils and privations could not but throw a damp over the gratification that we naturally felt on returning from the solitudes of savage life to the abode of civilized man.

Among other collections in natural history made during these two expeditions into the interior, 58 specimens of birds found on the banks of the Corentyn have been sent to the British Museum; 400 other specimens, collected on the Berbice, have unfortunately been lost on board a vessel during the late hurricane in the West Indies.

Also a collection of about 8000 dried specimens of plants, consisting of nearly 400 species, among which are several kinds of *Lacis*, the rare genus *Cleistes* of Richard, the *Mora* and Greenheart trees, of which so little has hitherto been known, a species of that singular genu *Balanophora*, and many other curious plants.

But the most striking object discovered in the vegetable kingdom is a gigantic water lily, with leaves six feet, and fragrant flowers fifteen inches, in diameter, which, at the wish of Mr. Schomburgk, and with Her Majesty's gracious permission, has been dedicated to our Sovereign under the name of

Victoria Regia.

It is supposed to be the same as the plant called *Euryale Amazonica* by Pöppig, who met with it on the river Amazons; but it is a distinct genus in the opinion of Professor Lindley, who has printed for private distribution a short account of it, now in the library of the Geographical Society.

[By the latest accounts from Mr. Schomburgk, dated Demerara, Sept. 12, 1837, we learn that he had happily recovered from a severe attack of fever, and was again to start on the following day for William IV.'s Cataract on the Essequibo, in 3° 14′ N. lat., with the intention of exploring that river to its sources, and then to continue the examination of the range of mountains called the Sierra Acaray, believed to be the line of separation, in this part of South America, between the basins of the Essequibo and the Amazons.

ANALYSES, &c.

I.—*Coleccion de Obras y Documentos relativos a la Historia Antigua y Moderna de las Provincias del Rio de la Plata, ilustrados con notas y disertaciones.* Por Pedro de Angelis. (4 tomos folio.) Buenos Aires, 1836. Communicated by Sir Woodbine Parish, F.R.S.

The Geographical Society has received, through the kindness of Señor de Angelis, the first four volumes of this valuable work, the first attempt, we believe, as yet made, under any of the new governments of South America, to collect and bring before the world some of the many original records existing in their public archives, illustrative of the history and geography of the Spanish possessions in those parts, which it was the policy of the mother country so carefully to hide from public view. The project of extending the southern frontier of the province of Buenos Ayres, and the expeditions undertaken with the object of driving the Indians beyond the Rio Negro, appear to have led to a search for such information as in former periods was collected; and not only were many valuable papers thus brought to light relative to the Pampas, and those parts of the coast of Patagonia explored and partially settled by the Spaniards in the last century, but a mass of others of the highest interest, connected with the history of the original discovery and subsequent exploration of a great portion of those widely-spread regions formerly comprised under the government of the Viceroy of Buenos Ayres, and reaching from Patagonia to Peru. Señor de Angelis was fortunately able to appreciate the value of these materials; and under the patronage of the present government of Buenos Ayres undertook to publish them; no slight task in a country where all the *matériel* of the press—types, paper, and printers, are imported from Europe, vastly enhancing its expense. To meet this, the work has been brought out in monthly numbers; and as, in the course of its publication, the editor has received many additions to his original collection, there is a want of order as to subject and date in the arrangement of the whole, which is inconvenient in a work of reference. This, however, seems to have been unavoidable, and is easy of correction, if the work should reach a

second edition. To the South Americans, as to us, the greater part of the documents now published are equally new, and the interest taken by them in their appearance may be inferred from a list of nearly five hundred native subscribers annexed to the first volume.

Our limited space will only allow us to give brief notices of the several papers in this very interesting collection; but we can safely assure our readers that a reference to the volumes themselves, now in the library, will repay a careful examination of their contents. To geographers especially, many of them will be found to be of the first importance.

In the order of publication, the first paper in the collection is,

1. *La Argentina, or History of the Provinces of the Rio de la Plata, from the discovery of that river by Solis.* Written in the year 1612. By Don Rui Diaz de Guzman.

This is one of the early chronicles of the Conquistadores. The writer, a gallant and enthusiastic adventurer, allied to the noble family of the Duke of Medina Sidonia, appears to have been actuated by a laudable desire to transmit to posterity a narrative of events in which he was an actor himself, and some of his nearest relatives had played a conspicuous part: though never before published, several manuscript copies of it had got into circulation, one of which was lent to Dr. Southey, who used it in his history of Brazil: Azara speaks of it also, and in terms of the highest praise; esteeming it a better authority for the early history of the dominion of the Spaniards in those parts than any other work he had met with. It now appears with the advantage of an extensive and well-arranged collection of notes by the learned editor, which greatly adds to its value.

Though the author professes to give a description of countries for the first time explored by Europeans, his geographical data are of course not to be compared with those we now possess. His principal object seems to have been to record, as he says in his dedication to the Duke of Medina Sidonia, "the valiant deeds of those brave Spaniards who undertook the discovery, and the conquest, and the peopling of those parts, in the course of which (he adds) there happened many things worthy to be remembered;" and truly his account of the extraordinary perseverance and contempt of every danger and difficulty which so strikingly animated the first discoverers of those countries cannot but excite the admiration of every reader. Amongst them were many noblemen and gentlemen who, imbued with the true chivalrous spirit of the age in which they lived, appear, like brave knights-errant, to have sought for dangers only to overcome them. The boldness with which the new countries were explored and taken possession of is marvellous; considering that the natives of those regions were

not like the inhabitants of Mexico and Peru, but a warlike race who defended themselves against the invaders with an obstinate courage which often baffled the best laid plans of the Spaniards, and led to the slaughter of many of their most notable captains. Speaking of these Indians the editor says—

'They were all sprung from the same stock—that of the Guaranís—a nation whose origin, customs, language, and numerous offsets, would alone furnish copious materials for a work greatly wanted in the history of America. They reached from the southern Atlantic to the frontiers of the empire of the Incas, following the courses of the many great rivers and of their numerous ramifications which intersect all that vast portion of the globe. The Timbus, the Agaces, the Caracaras, the Payaguas, were all from this same stock, whose language was spoken alike by the Carios and Arachanes in Brazil, and by the Chiquitos and Chiriguanos in Peru. Every grade of barbarism, from the savage state to the first dawnings of civilization, were to be traced among the various tribes of this large family, which wandered to and fro, subject to no general law or direction. Anthropophagi in some places, and husbandmen in others, they submitted voluntarily to the authority of their Caciques, and to the dictation of their Diviners or Jugglers. The extent of their religion was comprised in the two names of a good and evil spirit, *Tupa*, the translation of which is, *Ah, who art thou?* and *Anang*, the *Persecutor of souls.* Of these Anang, the bad spirit, was by far the object of most veneration, and in propitiating him it was that the influence of the Diviners was principally exercised.

They had a confused tradition of a great deluge which destroyed all their nation, except two individuals, who saved themselves by climbing a lofty palm tree, on the fruit of which they subsisted till the waters subsided.

Their government was vested in an hereditary Cacique in time of peace, and in an elective dictatorship in war: in both cases they yielded a blind obedience to their chiefs, however despotic. The authority of the parent over his children was as absolute as that of the Cacique: marriages were as easily broken as made! Their diversions consisted entirely in dancing and drunkenness: they began with shouts, and ended with blood: their chosen beverage was a fermented liquor, made from maize or honey, and of this they drank till they fell down in a state of madness; at such times they seized their darts, and aimed deadly blows at their best friends and companions. They can hardly be described as a nomadic people; but yet they had, if their traditions are to be credited, undertaken distant conquests; embarking on the rivers in their canoes, and without other arms than their bows and clubs. They boasted of having never submitted to a foreign yoke; and when they bowed their necks to that of the Spaniards, it was under the delusion that they were treating with allies, not foreseeing that they were to be made slaves of.'

Such were the Guaranís in those times. Their language is still spoken by most of the Indian tribes of the western frontiers of Brazil, and may be traced from the Parana to the Marañon.

The Jesuits published a grammar and dictionary of it, which were used in their celebrated missions in Paraguay, where, at a later period, this once warlike people submitted themselves with such wonderful docility to their spiritual sway.

2 and 3.—*Account of the Journey of Don Luis de la Cruz from the fort of Ballenar, on the frontier of the Province of Conception, in Chile, through unknown lands, inhabited by Indians, to the city of Buenos Ayres, performed in the year* 1806.

The want of a more direct means of communication between Buenos Ayres and the southern provinces of Chile had long been felt, and at the beginning of the present century the governors of those countries received directions to ascertain how far it was practicable to open a shorter passage across the Pampas, south of the old beaten track between the two capitals by Mendoza. This led to the discovery of some new passes over the Cordillera, and amongst them that of Las Damas, which it was said might be crossed in carriages.

In the spring of 1806, an expedition was planned to start from the frontier fort of Ballenar, near Antuco, in Chile, direct across the continent. The command was entrusted to Don Luis de la Cruz, who had a strong personal interest in its success. The intervening country was in the nominal possession of the Peguenches Indians as far as the river Cudileubú (Atuel?), beyond which the Ranqueles tribes claimed all the lands to the frontiers of Buenos Ayres. With the first of these nations the people of Chile had at that time a good understanding, and the principal caciques were in consequence easily induced to undertake to escort the expedition so far as their jurisdiction extended. With their aid, and his own party, consisting of sixteen persons, officers and men, Cruz started from Antuco on the 7th of April, 1806. On the sixth day, when he had gone about eighteen leagues on his journey, he arrived at the river Neuquen, formed by many streams from the Cordillera, the principal of which appear to be the Rinquilcubú, which descends from the Sierra de Pichachen, and the Cudileubu, the drain of many smaller rivers, which have their sources in the Cordillera further north. The Neuquen, from the junction of the Cudileubú, Cruz says, no one doubts is navigable to where it falls into the Rio Negro, and thence to the sea.

Proceeding onward, the expedition came to another river, called by the Indians the Cobuleubu, described to be as large as the Neuquen, and which, as far as he could learn, Cruz says *does not unite* with that river, but after a long bend to the east-north-east, which the expedition followed for several days, turns again to the south, and runs to the sea: if this be true, it can be no other than the Colorado.

Still farther on, and when the expedition had travelled, according to their daily measurement, seventy-four leagues from Antuco, they came to a river called by the Indians the Chadileubú, which they described to be joined by the Diamante about five leagues below where it was crossed by the expedition, and farther on by the Desaguadero, which they also soon after passed. This river, therefore, must be the Atuel; more to the south, the Indians stated it to be lost in a chain of lakes resembling those of Guanacache to the north of Mendoza.

Cruz's account of these rivers throws much new light upon the hydrography of this part of the Pampas, and will doubtless enable geographers to correct many errors which exist in the maps hitherto published.

As the Chadileubú was the nominal boundary of the lands of the Peguenches, they would not proceed without first sending an embassy to their neighbours, the Ranqueles, to explain the object of the expedition; nor was Cruz backward in promising them suitable presents, if they would follow the example of the Peguenches, and assist in conducting his party safely to the frontier of Buenos Ayres. Their leave obtained, the expedition proceeded, and striking direct across the Pampas to the fort of Melinqué, the north-western point of the territory of Buenos Ayres, they arrived there, without hinderance or accident, on the forty-seventh day after leaving Antuco, having travelled, according to their measured distance, 166 leagues.

Whilst resting from their fatigues at this place, some straggling soldiers galloped in from Buenos Ayres, bringing the unlooked-for news of the landing of General Beresford's little army, and the surrender of the capital to the English; the Viceroy, it was said, had fled to Cordova, and thither Cruz proceeded, after dismissing his Indian companions, who had served him the whole way with the greatest fidelity and zeal, and who took an affectionate leave of him, notwithstanding his inability, under the circumstances, to reward them as he had promised upon his arrival at Buenos Ayres.

This was the last attempt at discovery made during the rule of the Spaniards in South America, nor did the power of the mother country survive long enough to permit even this to be acted upon. The very journal of the expedition was lost sight of, and but for Señor de Angelis, might never again have been heard of. It is an interesting volume, and amongst other descriptions, contains a minute account of the manners and customs of the Peguenches, which seem to differ but little from those of the Araucanian nation from which they are evidently sprung, and of which a full account has been given by Molina.

In describing the physical features of the country through which he passed, Cruz makes many observations highly interest-

ing in a geological point of view. He was greatly struck, amongst other things, with the abundance of fossil marine remains in all the vallies on the eastern slopes of the Cordillera. Coal, he says, is to be met with after passing the Neuquen; probably of the same sort as that which has long been known to exist on the opposite side of the Cordillera, on the sea coast; and inexhaustible deposits of salt.

4. Falkner's *Account of Patagonia, originally published in English.*

This curious work, which is now scarce and rarely to be met with, contains the only description hitherto published of the country to the south of Buenos Ayres, upon which any reliance can be placed. The author was a Jesuit, who, after passing nearly forty years of his life in the unknown regions he describes, upon the expulsion of his order from South America, returned to his native country, and published this book. One of his objects was to point out how vulnerable were the King of Spain's possessions in those parts; and there is no doubt (as will be seen by other documents in this collection) that his observations upon this subject induced the Spanish government to found several settlements soon after its appearance, upon the coast of Patagonia, of which the only one now remaining is that on the Rio Negro.

That the work should never before have appeared in the Spanish language, is a striking exemplification of the jealous policy of Spain, and of the care taken to prevent the people of South America from acquiring correct knowledge even of their own country.

Our readers will find a copy of it in the library of the Society, in the original language.

5. *Collection of Documents relating to the City of the Cæsars* (*de los Cæsares*), *supposed to exist in the Andes, south of Valdivia.*

The history of the supposed city of the Cæsars seems almost a repetition in a more southern region of the fabulous account of El Dorado, excepting that the evidence adduced in support of the existence of Los Cæsares is so positive and circumstantial as to do away with much of the wonder that such a tale should have imposed not only on the vulgar, but on some of the most learned of the Jesuit fathers, and upon the court of Spain itself, during the best part of two centuries. The least extravagant of the accounts given of this people represented them as inhabiting a city built some distance south of Valdivia, about a couple of leagues from the sea, upon an island called Payequé, in a lake in the Cordillera:—it was described as surrounded by a wall and ditch, and to be defended by artillery:—the houses to be of stone, and roofed after the fashion of Old Spain, and the churches rich and full of silver ornaments:—in their houses the people, who were described as of a fair complexion and habited like Europeans, were served by Indians whom they had reduced to Christianity:—

the snowy Cordillera hid them to the north and west, but to the south and east lay extensive plains which were covered with their herds and flocks, and laid out in corn-fields and gardens. Many witnesses swore to the truth of this description, to which others made the most marvellous additions.

Various were the conjectures not only as to the precise place where this people was to be found, but as to whence they could have come:—some believed them to be the remnant of the Spaniards who had fled from Osorno and the other cities on that part of the coast, destroyed by the Araucanians in 1599; others, that they were the crews of ships known to have been lost in the Straits of Magellan; but none seemed to doubt the fact of their existence.

So lately as 1781, the court of Spain was strongly urged to take some steps to ascertain whether they were not still to be found; and the governor of Chile was in consequence ordered to collect and report upon the whole of the evidence which existed upon the subject. This, we are told, consisted of no less than nine volumes of depositions and other documentary evidence. The fiscal's report upon which has been printed at full length by Señor de Angelis, and sums up after a prolix analysis of the testimony of every individual witness in the terms following:—"Considering such a mass of evidence, there appears no room to doubt the existence of a settlement, either of Spaniards or strangers, in the Cordillera, towards the Straits of Magellan and Cape Horn; and though there may be some difference in the accounts given by the Indians as to the precise spot on which they have been seen, this may be accounted for, &c. &c."

It does not appear, however, that the court of Spain thought fit to move farther in the matter, and the whole story is now as generally disbelieved as it was once credited.

Without running into either of these extremes, we think the temporary sojourn and occasional visits of Europeans to those parts of the coast where their appearance was a novelty to the natives, and may have created exaggerated impressions upon a simple race, may account for a great part of the history of Los Cæsares.

Voyages of discovery, shipwrecks, attempts at colonization, buccaneering, sealing and whaling expeditions, may all have contributed to establish the belief that strange people were upon the coast, who being in reality but casual visitors, no one afterwards could find.

6. *Account of a Voyage from Buenos Ayres to explore the Coast of Patagonia as far as the Straits of Magellan, in* 1745. By the Jesuit Fathers Quiroga and Cardiel; by order of his Catholic Majesty.

The object of this voyage was to examine the coast of Patagonia, in order to see whether there was any suitable point on

which to found a settlement, and avowedly originated in the alarm created by the appearance of the account of Anson's voyage. It contains some information respecting the general aspect of the coast in question, and the determination of several points by observation, which the fathers state had not been correctly laid down by former navigators. Off the river of Santa Cruz they were nearly lost, which leads them to remark upon the great alteration which must have taken place in the depth of water in that river since it was first discovered, and they quote authorities to show, that in former times large ships could safely enter it, whereas when they were there it was blocked up by dangerous sand-banks, upon which they narrowly escaped shipwreck. They point out some errors in the account given in Anson's voyage, and by other foreigners, of the country about San Julians, especially as to the existence of a large river laid down in the old maps, and having its sources in a lake forty or fifty leagues inland, applying somewhat dryly, though perhaps deservedly, to the authors of such wilful mistakes the old Spanish adage—"*á luengas tierras, luengas mentiras!*" The latitudes given of San Julians, Port Desire, and Santa Cruz, differ only a few seconds from the more recent observations by the officers of her Majesty's ship Beagle.

7. *Project for extending the Frontiers of Buenos Ayres to the River Negro, by* Captain Undiano. *To which is added, the Diary of a Journey made from Buenos Ayres to the City of Talca, in Chile; by the* Señores Zamudio and Souvillac. 1805.

In the first of these papers, Captain Undiano points out the advantage which might result from adopting the line of the Diamante or Neuquen to its junction with the Negro, and thence from that river to the sea, as the boundaries to the south of the provinces of Buenos Ayres, San Luis, and Mendoza, thereby inclosing, as he says, 16,000 square leagues of the best land in the world; which, by the establishment of a few fortified points, might be easily secured from the predatory incursions of the miserable Indian tribes which now wander, as he says, like gipsies over those parts of the country. His opinions are grounded upon having been employed against the Indians in 1784, in pursuit of whom he had passed by the rivers Diamante and Atuel, and had been nearly as far south as the junction of the Neuquen to the Negro, described by Villarino. His paper affords, therefore, some additional data as to the course of that river, with which we are so imperfectly acquainted.

Zamudio's itinerary is valuable to the geographer, and gives the distances minutely from place to place, along a line of road passing from Buenos Ayres by Melinqué; the fort of San José, near the lake Bevedero, south of San Luis; Corocorto, on the river Tunuyan; along the course of that river to the fort of San Carlos; and thence by that of San Rafael, on the Diamante. Zamudio

entered the Cordillera by a valley, through which ran the head waters (manantiales) of the river Atuel, which led him to the pass of the Planchon, where he describes the Cordillera at its summit, instead of broken and precipitous as might be expected, to be a table land, as level and easy to be crossed as the Pampas of Buenos Ayres:—descending on the opposite side by the Valle Grande, he passed the Rio Claro at Quesara, and reached Talca after a journey of 388 leagues.

8. *Memoir on the Spanish Settlements on the Coast of Patagonia, drawn up for the information of the Marquis of Loreto, Viceroy of Buenos Ayres, by* Don Francisco de Viedma, *Superintendent of the said Settlements.* 1784.

This paper treats of a subject which might have been of considerable consequence (had the author's opinion been adopted) to Spanish interests in that part of the world. It contains an account of the several settlements formed by the Spaniards on the east coast of Patagonia, from the unfortunate expedition of Sarmiento, to the establishment of colonies at San José, Port Desire, and San Julians, in 1788; and of the causes which led to their subsequent abandonment.. Viedma, who had had the general superintendence of those establishments, and had watched their progress and prospects with great interest, deplores the policy which induced the Court of Spain to give them up at the moment, he says, when their capabilities and utility were becoming apparent. Independently of other important political considerations, he had looked to them as a source of wealth to Spain, from the whale and seal fisheries on those coasts, which they might have commanded, and which other nations have since reaped the benefit of. They promised also to Buenos Ayres an inexhaustible supply of salt, an article of first necessity there in the preparation of the staple articles of export. He quotes the example of the colony on the Rio Negro, established at the same time, and the only one which had not been broken up, to show that it was perfectly within the power of the settlers to provide for their own subsistence, and that it was an error to suppose that either the climate or soil was unfit for the production of the necessaries of life.

Speaking of that colony, viz., on the Negro, he strongly urges the importance of keeping it up, and shows the immense advantages which may ultimately result from Villarino's discovery that that river affords a navigable communication across the continent to the foot of the Andes over against Valdivia; and he urges the formation of military posts upon it, and especially at the great pass frequented by the Indians near the island of Cholecchel, as the best means of preventing the predatory incursions of those savages against the province of Buenos Ayres.

In this Viedma only repeats the opinion given by Villarino, and

often, at subsequent periods, urged by others with the like result, to no purpose. It is only now more than half a century afterwards that precisely the same remedy for the same evil appears to be the only effectual one, and that General Rosas, the Governor of Buenos Ayres, is carrying into effect the plan suggested by Viedma.

To most of our readers, the historical fact that there ever existed any European establishments on the coast of Patagonia will, we believe, be entirely new.

Volume II.

9. *Description of Potosi and its Dependencies, in* 1787, *by the Governor*, Don Juan del Pino Manrique.

Señor de Angelis observes, that no authentic history of this celebrated city, whose mines have enriched the world, has ever been before published. This account of it was written in 1787, by one of its governors, and goes back as far as the first discovery of its mineral treasures in the year 1546. It comprises, also, a description of the districts of Porco, Chayanta, Chichas, Lipes, and Atacama, which formed part of the intendency of Potosi; the whole jurisdiction comprised in which he calculates to have been little short of 600 leagues in circumference. The population then amounted to 216,871 souls, of which 24,206 resided in the city of Potosi. But Potosi had then lost much of its original importance. In 1611, the editor observes, the inhabitants of the city alone were estimated at 150,000. From the discovery of the mines to 1783, the quantity of silver, on which the King's duties were paid there, amounted to the enormous sum of 820,513,893 dollars; and it was supposed that nearly as much more had been taken out of the mines which had not been brought to account.

The extravagance of the people seems to have been in proportion to their wealth. The celebration of the coronation of Charles the Fifth was said to have cost them eight millions; and the funeral ceremonies, on the death of Philip the Third, no less than six millions of dollars. Of the fortunes of some individuals, some idea may be formed from the fact of the marriage-portion of a daughter of General Mexia amounting to a million of dollars (in 1612): and of another young lady, a daughter of a General Perera, a few years before, to 2,300,000 dollars. The waste of human life in bringing these treasures from the bowels of the earth was frightful, and depopulated sixteen extensive provinces, the unfortunate native inhabitants of which were subjected to the Mita—an Indian word but too significant of the part which all *in turn* were obliged to take in this unwholesome labour.

10. *History of Paraguay, the Provinces of La Plata and Tucuman, by the Jesuit* Father Guevara. Vol. I.

Guevara was one of the most enlightened of the Jesuit fathers,

and was the contemporary and associate of Falkner and Dobrizhoffer, whose works upon South America have been published in our own language. The present, which is a much more comprehensive work, would be quite as interesting, if translated, to English readers. It gives a general description and history of Paraguay and the provinces of La Plata, from their first discovery down to the year 1621. In a second volume Guevara completed the historical part to his own time; but on the expulsion of his order from South America, the manuscript was transmitted to Spain by the Viceroy, Bucarelli, who it is said had received express orders to secure it; such importance did the ruling powers in the mother country attach to its suppression. The volume which escaped, and which is now published for the first time, is divided into two books; the first descriptive of the government, manners, and customs of the original Indian inhabitants of the country—with some account of its natural history: the second, which is perhaps the most valuable, contains the history of the several governments of the Spanish commanders who succeeded each other from 1515 to 1620. A subsequent compiler has added a succinct notice of those who followed, down to the last of the viceroys, Cisneros, with whom, in 1810, concluded the rule of Spain in that part of South America. The whole affords materials of interest to the historian.

Guevara has not hesitated to adopt the generally received opinion, that a race of giants once inhabited that part of the world; in proof of which he refers to their bones, so often met with in many parts of the country, especially about the river Carcarana, south of Santa Fé. In our days, science has corrected this error, and shown that the bones in question are not human, but belonged to the lost species of the mastodon and megatherium.

11. *The Argentina, or Conquest of the Province of La Plata, an Historical Poem, by the* Archdeacon Martin del Barcocentenera. 1601.

The Argentina is an attempt to imitate the Araucana of Ercilla, being a rhyming chronicle, as the editor calls it, of the 'History of the Conquest of the Provinces of La Plata.' The author, like Ercilla, though a priest instead of a soldier, was an eye-witness of many of the most remarkable incidents he relates, and passed twenty-four years in various parts of the countries he describes. He has recorded much that is not to be found elsewhere, except on his authority. This poem is to be found in the third volume of "Barcia's Historiadores Primitivos de las Indias;" but Angelis says, with so many errors, that he has had no hesitation in giving another version of it. It is now accompanied by a collection of notes, which add greatly to its value.

12. *Deccription of the River Paraguay, from the mouth of the River Xaurú to its junction with the Parana.* By the Jesuit Father Quiroga.

Father Quiroga, the author of this valuable geographical document, is the same who accompanied the expedition sent to survey the coasts of Patagonia in 1745 (noticed in Nó. 6 of this collection). He was subsequently selected to determine the geographical position of the several missions of the Jesuits in Paraguay, and to lay down a map of that country, which was completed and published at Rome in 1753, by Franceschelli. "One of the most incorrect portions of this map," observes the editor, "was the course of the river Paraguay;" and it was precisely that which Quiroga had shortly afterwards an opportunity of setting right, being appointed in 1752 to accompany Flores, the Spanish commissioner charged to set up the boundary mark at the mouth of the Xaurú, in fulfilment of the sixth article of the treaty between Spain and Portugal, signed at Madrid in 1750.

The result of his observations on this occasion was adopted by Don Luis de la Cruz, in his great map of South America, published at Madrid in 1775.

As Quiroga's paper is only to be found in Morelli's Latin edition of Charlevoix, we shall give a few quotations from it.

In the first chapter he describes the course of the river Paraguay, from its sources to its junction with the Parana, stating the positions of the mouths of all the principal rivers which flow into it from the Xaurú in 16° 25′. Below the Xaurú, he says, the Paraguay divides into two considerable branches, the principal one running in a narrow but deep channel through the Xarayes (and it was through this that Quiroga himself passed): the other branch flows some leagues to the westward.

Farther down the Porrudos joins it in lat. 17° 52′, and other rivers successively as follows, viz.:—

The Tepoti in	21°	45′	The Xexui in	24°	7′
The Corrientes in	22	2	The Quarepoti in	24	23
The Guarambaré in	23	8	The Ibobi in	24	29
The Ipaneguazú in	23	28	The Mboicaéin	24	56
The Ipané-mini in	24	4	The Salado in	25	1

The city of Assumption he places in 25° 17′ 15″ lat., and long. 58° 5′ W. of Greenwich, though, he says, according to others, it is in 25° 16′ lat., and 58° 7′ long. A little below it the Pilcomayo runs into the Paraguay from the Chaco, by three mouths. The mouth of the Tebiquari is in 26° 35′. The Bermejo joins in lat. 26° 54′, eleven leagues direct distance from the city of Corrientes, where the junction of the Parana and Paraguay takes place in lat. 27° 27′, long. 58° 22′ W. of Greenwich.

In the subsequent chapter the several Indian tribes met with

upon the shores of these rivers are described, as well as the physical features of the country passed by; and the paper concludes with an account of the provinces of Cuyaba and Mattogrosso, their gold and diamond mines, and other productions, and of the inland navigation by which the Portuguese from San Pablo reach those districts.

13. *Diary of the Navigation and Survey of the River Tebiquari; a posthumous work of* Don Felix de Azara. 1785.

Everything of Azara's is valuable. The title of this paper hardly does justice to it: it ought rather to be called a "Month's Excursion in Paraguay." The author started from Assumption by the road which leads to Villa Rica in the interior, thence passing by Casapa, he reached Yuti, where he embarked in a canoe, to follow the river Tebiquari to where it falls into the Paraguay. He returned on horseback by the road which skirts the left bank of that river—a difficult and painful undertaking at the time from the overflowing of the river and the inundation of all the country along its banks. In these swamps the musquitoes and innumerable venomous insects drove both men and horses almost mad. Man to live in these regions should be amphibious, and armed like the caymans and crocodiles. Azara's object was to lay down correctly the position of every place he passed through, and every feature of the country he could observe with any tolerable accuracy from a distance.

His daily observations are given with the greatest minuteness, and are quite sufficient to enable the geographer to map by them a considerable portion of Paraguay Proper. The possibility of navigating the Tebiquari, which was verified, was of importance, inasmuch as the upper part of that river is situated near some forests where the celebrated Paraguay tea is cut—the great article of export from Paraguay. To send it down the Tebiquari was, if possible, obviously the easiest way of conveying it to the Paraguay, instead of by the overland road to Assumption, as had been the custom previously. Much valuable timber is cut on its banks, and floated down by it, to be sent to Buenos Ayres.

From Yuti, where Azara embarked, it required thirteen days to reach the Paraguay, in a canoe; the whole course of the river being extremely tortuous. • •

His description of that place may serve as a sample of the other Indian towns through which he passed, and where the system established by the Jesuits was then still in a great measure in operation; the main difference consisting in the Indians working on their own account, instead of for the community. The administration of the place was committed to a corregidor, with other auxiliary officers: it was his duty to keep the Indians in order, and to flog them when necessary; but he was not per-

mitted to inflict more than fifty lashes. His deputies, the alcaldes, could only go as far as six. Two of the oldest of the Indians visited every morning the houses of the rest, to see who were sick and required assistance, which it was their business to administer —an office, says Azara, much in request, inasmuch as the holders of it had always the means of taking good care of themselves.

The dress of the women was a single garment, like a long chemise, called *tipoy:* the widows wore it black, and the girls and married women white, their long hair hanging down their backs. The men wore the poncho and dress of the gauchos of Buenos Ayres, and went about with arrows and spears, a custom which they appear to have inherited from their forefathers, who were constantly at war with their neighbours.

Their principal occupation is cutting and preparing the *Yerba* or tea, of which, in the year Azara was amongst them, the people of Yuti alone had collected 16,600 arrobas, or about 400,000lbs.

Volume III.

14. *Geographical and Statistical Account of the Intendency of Santa Cruz de la Sierra.* By Don Francisco de Viedma, the Governor. 1788.

The editor commences his remarks on this work by observing how vast a portion of the American continent is yet unknown; and how much is wanting to complete our knowledge even of its leading geographical features. Of this, the country here described may be quoted as a striking example:—situated in the midst of mountain chains, difficult of access, far from the sea-coast, without commercial relations, and only in contact with the uncivilized tribes of the adjoining regions, its name hardly figures in our maps; and yet it is extensive and populous, and abounds in the choicest of nature's gifts; sugar, coffee, cocoa, rice, cotton, honey, indigo, are some of its productions, whilst the bowels of the earth are full of mineral treasures. The Spaniards found in it numerous native tribes, whose caciques were richly habited, and lived in luxury:—the crowns and the armlets, and the cups of gold and silver which Cabot sent to Charles V., and which led to the misnomer of "the River Plate," were part of the booty which had been collected by Alexis Garçia in these regions. But whatever may have been the wealth and industry of the natives in those days, it soon disappeared under the yoke of the conquerors, and the enervated half-cast race which grew up with no excitement to improve their condition under the Spanish colonial system, were content to sleep away their lives under a tropical sun, in a state little better than perpetual idleness.

When Viedma was appointed governor-intendant, about 1787, of Santa Cruz de la Sierra, he was greatly struck with its capa-

bilities, if properly administered; and much of the work now before us comprises an investigation into the evils of the existing system, and his suggestions for a better government, which, by stimulating native industry, might lead to the development of the great natural resources of the country. He was the same individual who had previously superintended the settlements on the coasts of Patagonia, and whose report is noticed in No. 8 of this collection. He might as well have preached to the winds.

But things are at last changed in that part of the world: the people have thrown off the yoke which kept them down, and henceforward their prospects depend upon themselves. The editor truly observes, that at present they, and all the new states of America, are but in their infancy:—give them but time to pass the crisis produced by the sudden and entire change which has taken place in their institutions and it may be fairly expected that their progress will be rapid:—no one can calculate their future destinies, but all may see that they contain within them the elements of prosperity:—Europe will be provided from them with many a valuable production now unknown; and the day may come when the sugars of Cuzco, the coffee of Huanuco, and the cocoa of Moxos and Apolobamba will rival those of Brazil, Guayaquil, and Caraccas. Nor is this an idle or groundless speculation: a learned naturalist, Haenke, who resided many years in those parts, has shown they are not, as had been long supposed, excluded by nature from the possibility of carrying on a commercial intercourse with the rest of the world: he has shown that there are navigable rivers—the Beni, the Marmoré, and the Itenes, with their affluents—by which their produce may be carried into the great river, the Madera, and floated down the Marañon, and thence to the Atlantic. Haenke's invaluable paper on this subject was printed in volume V. of our journal, and may be usefully referred to as illustrative of the hydrography of the country described by Viedma. He himself, on the other hand, points out the possibility of a southern passage, or road, across the flat country from Santa Cruz to the Parapiti, and thence to the Pilcomayo, which is at no great distance from it, and is believed to be navigable the whole way to its junction with the Paraguay, opposite to Assumption.

Thus, either by the Marañon or the Rio de la Plata, the produce of Santa Cruz may find an outlet which may make the inhabitants of those countries hereafter a commercial people, though situated in the heart of the continent.

In Viedma's time the Government of Santa Cruz, which now forms an important portion of the new republic of Bolivia, extended from lat. 16° 38′ to 20° S. lat., and comprised the departments of Cochabamba (the capital), Clisa, Misque, Valle Grande,

and Santa Cruz, and the less important districts of Sacaba, Arque, Tapacari, and Hayopaya.

Of the several towns in each department, and their respective population divided into casts, Viedma gives a minute description, setting forth the natural productions and capabilities of each.

He places the situation of Oropesa or Cochabamba, the capital, in lat. 17° 22′ 33″. It stands on a plain at the foot of the Cordillera, which is liable to be inundated during the periodical rains, whence its name of Cochabamba, or Cocha-pampa, which signifies a marshy plain. The climate, he says, is temperate and healthy, for, though in a tropical latitude, such is the elevation of the whole country that the Cordillera in the neighbourhood is capt with perpetual snow.

The houses, which are large and convenient, are built of unburnt bricks, and thatched with straw; some of the best of them have two stories: the churches and convents are numerous and well-endowed: the inhabitants were then estimated at upwards of 22,000; they spoke the Quichua language, and even many of the ladies of the better class did not understand Spanish.

The population of the whole province amounted to above 180,000 souls; the labouring part of which were chiefly employed in the manufacture of coarse cotton cloths, called *tucuyos*, for which, at that period, there was a great demand, not only in all the adjoining provinces, but in those extending to Buenos Ayres. The annual value of the imports and exports of the whole intendency Viedma shows, even then, was equal to more than a million and a half of dollars.

The paper concludes with an interesting description of the missions in the provinces of Moxos and Chiquitos.

15. *Some Account of the Province of Tarija.* By Don Juan del Pino Manrique, Governor of Potosi; in a Letter to the Spanish Minister Don José Galvez. 1785.

The notice of this paper would be more in its place after the description of Potosi (No. 9), by the same writer.

Tarija is at present the frontier province of the Bolivian Republic towards the south. Manrique describes it as consisting of a succession of charming valleys, with a delightful climate and fruitful soil; in no part of America, he says, had he seen any country to be compared with this. Corn, maize, the yerba-maté of Paraguay, the coca, flax, and every necessary of life are produced there in the greatest abundance; and such is the increase of the native population in consequence, that great numbers yearly emigrate to settle in the lands farther south, in the jurisdiction of Tucuman. But with all this, he adds, no one knows anything of Tarija. The Spanish authorities, in whose jurisdiction it is situated, never took the trouble to visit it, because as it was known to possess no mine-

ral treasures, and to be merely inhabited by an agricultural people, it was not deemed worthy of the slightest attention.

The main object of the paper is to draw the minister's attention to its natural resources, and the utility which would result from fomenting the industry of the inhabitants, and giving them more importance.

16. *Diary of a Journey to the great Salt Lakes in the Pampas of Buenos Ayres.* By Don P. Andres Garcia. 1810.

This paper, like the last, is out of its place, and should have appeared in the first volume, in connexion with Cruz's Journey across the Continent.

In old times the people of Buenos Ayres were supplied with salt from the great lakes in the south, here described; but as the lands in which they were situated were overrun by the Indians, it was necessary to send an armed force to accompany the periodical expeditions undertaken in quest of it. The editor mentions one of these annual expeditions (in 1778), which consisted of 600 carts, with 12,000 bullocks to draw them; 1000 men, escorted by 400 soldiers and 2600 horses: sometimes they were attended by artillery, to make a more imposing appearance amongst the Indians: in 1810, Don Pedro Garcia was appointed to command one of these parties; and, being a competent geographer, was charged to avail himself of the opportunity to draw up a particular account of the physical features of the country he passed through, and to map it to the best of his abilities. This he has done, and his paper, moreover, contains many details respecting the Indians of the Pampas, which assist us greatly in acquiring a knowledge of the manners and customs of those gipsy tribes.

The daily distances, with a series of latitudes and longitudes, are given in a tabular form; from which the route of these expeditions, and the position of the Salinas, have been laid down, and copied into Mr. Arrowsmith's last map of the Provinces of La Plata.

The largest of these salt lakes is situated, according to Garcia, in lat. 37° 13′, and 63° 14′ long. W. of Greenwich.

17. *Memoir on the Navigation of the River Tercero, and other affluents of the Parana.* By Don Pedro Andres Garcia. 1813.

The river Tercero, which rises in the province of Cordova and falls into the Parana, it appears was examined in the time of the Spaniards, and proved to be navigable for barges as high as the Pass of Fereira, about thirty leagues below the city of Cordova.

The object of the writer of this paper is to show the facilities it affords for the transport of the produce of the provinces of Cordova and Cuyo to Buenos Ayres; while the Vermejo and Pilcomayo may be turned to the like account by the inhabitants of Tucuman and Salta and Upper Peru. The whole of his paper

tends to prove that there is no part of the world in which greater facilities are afforded for the establishment of an inland navigation.

18. *Historical, Geographical, and Political Account of the* ci-devant *Jesuit Missions in Paraguay.* By the Governor Don Gonzales de Doblas. 1785.

In the whole of this collection there is not a more interesting work than this. Its title is fully realized by its contents, which certainly comprise the most valuable account of Paraguay as yet published. Doblas was appointed to administer the new system of government established in the Guarani towns, after the expulsion of the Jesuits in 1768—a system full of errors, and which in a very few years led to the total ruin of those celebrated establishments. He arrived, however, in time to foresee and to foretell their inevitable fate,* unless a radical change took place in the mode of managing them; and one of the main objects of his labours was to draw the attention of the court of Spain to the absolute necessity of this, if they desired to preserve them. Señor de Angelis states, that some years afterwards the king showed a disposition to adopt his honest suggestion, but it was then too late; the depopulation of the missions was complete, and the ruins of their churches and buildings are all that, in many places, are now left to show that they ever existed. Although in a geographical point of view this work is of great interest, it is still more so as correcting some of the many erroneous impressions respecting the rule of the Jesuits in Paraguay, and goes far to justify them from the calumnious attacks made upon them by those who were interested in destroying the reputation of that celebrated order.

19. *Ulderic Schmidel's Voyage to the River Plate, in* 1534, is not new to us; it is to be met with in most of the collections of early voyages to that part of the world.

20. *The remaining Papers of the third volume of Señor Angelis' work consist of a Collection of Original Records, showing*—1st, The foundation of the city of Buenos Ayres in 1580, by Don Juan de Garay, and his allotment of the lands and Indians to his followers; 2nd, The foundation of Monte Video in 1724; 3rd, The "*Actas Capitulares,*" or Proceedings of the Cabildo and People of Buenos Ayres, upon receipt of the news of the successes of the French in Spain, and the overthrow of the legitimate government of the mother country, which led them to establish their own first Junta in 1810.

These documents, though valuable to the historian, hardly come within the province of this Journal to notice further. In our next volume we hope to continue the analysis of the remaining volumes of Señor de Angelis' interesting publication.

* In the first seventeen years the population decreased from 100,000 to 60,000.

II.—*Reize door der weinig bekenden Zuidelyken Molukschen Archipel, door Lieut. D. H. Kolff, Jun.* Amsterdam. 1828. *Voyage through the Southern, or little known part of the Archipelago of the Moluccas, &c.* Communicated by G. W. Earl, Esq., M.R.A.S.

[The little information we possess of this chain of islands, extending from the eastern point of Timor 500 miles towards New Guinea, only slightly mentioned by Valentyn nearly two centuries ago, and characterized by Horsburg "as very imperfectly known," and the importance they derive from their position within one day's sail of the northern coast of Australia, induces us to offer an analysis of a work very little known, we believe, in this country, and the author of which has actually visited all the islands he describes.—Ed.]

The following voyage, which was performed in the Dutch colonial brig Dourga, was undertaken by the Netherlands Government for the purpose of obtaining information respecting the natural productions and commerce of the islands lying between Timor and the south-west coast of New Guinea, and of the condition of their inhabitants. The Dutch East India Company formerly had small settlements and spice-plantations on many of these islands; but towards the close of the last century they had been abandoned, and since then scarcely any intercourse had existed between their inhabitants and the Dutch.

May 26, 1825, the Dourga left Amboyna, and on the 2nd June arrived at the Portuguese settlement of Dilli, on the north-west coast of Timor. Although this is their chief settlement in the Eastern Seas, it is nothing more than a miserable slave-station. The garrison is small and ill paid, and the government officers obtain the greater portion of their income by monopolizing the trade. Sandal-wood, bees' wax, cattle, and sheep, can be obtained here; but the chief export consists of slaves, who have been kidnapped in the interior. A large ship from Macao was in the roads, but not a single native trader. The soil is fertile, but agriculture is totally neglected.

June 6, the brig left Dilli and stood over to the south coast of Wetta. Kissa, Lettee, Moa, Damma, Lakor, and Luan, the principal islands of the group, and lying north and north-east of Timor, were subsequently visited. These islands are hilly, well wooded, and possess a fertile soil. At the north-east extremities of Moa and Damma are two high peaked mountains, and at the foot of that on the latter island some hot-springs were found. The natives are tall and well made. Their complexion is light-brown, and their features bear much resemblance to those of Europeans, their foreheads being high, and their noses pointed. Polygamy is unknown. The clothing of those who cannot obtain European or Indian cotton cloth (the value of which is great, owing to the

limited nature of the trade), wear pieces of prepared bark, fastened round their waists. The Dutch formerly had small establishments on all these islands, but they were abandoned more than half a century ago. The flags and staffs of office with which the chiefs had been furnished by the company were still preserved. The crew of the Dourga were everywhere received with open arms by the natives. This favourable reception was chiefly owing to the meritorious exertions of M. le Bruin, a Protestant missionary, who has resided some years at Timor Coepang, and who is in the habit of frequently visiting the adjacent islands. On the island Kissa the greater portion of the inhabitants were Christians, and many others were to be found among the natives of the remainder of the group. Many of these had been born Christians, for the labours of the early missionaries had been very successful here. On one of the islands, which had not been visited by an European for a period of fifty years, many of the natives still retained their religion, and had small churches, in which native preachers officiated. The principal village on Kissa (the entire population of which were Christians) contained a large and well-built church; and all the youths, from ten years of age upwards, could read and write Malay in the Roman character, a native Amboynese schoolmaster and some assistants having resided among them some years. Many couples were united, and some hundreds of natives were baptized by M. Kam, a clergyman who accompanied the expedition.

The productions of these islands are sandal-wood, bees'-wax, pearls, tortoise-shell, trepang, edible birds' nests, Indian corn, rice, and vegetables, with abundance of live stock—namely, buffaloes, sheep, goats, hogs, and fowls. As the use of money is scarcely known, these are only to be obtained by barter, in exchange for cotton cloths, brass wire, iron, chopping knives, and coarse cutlery. The first-mentioned article is most in demand, and M. Kolff suggests that an European merchant might carry on an advantageous trade here. The value of an ox is from 8*s.* 4*d.* to 10*s.*; of a sheep from 3*s.* 4*d.* to 5*s.* Bees'-wax can be obtained in abundance at Roma, at the rate of 2*l.* 7*s.* per cwt. The trade with the islands is carried on solely by natives, those of Macassar, Amboyna, and the Arru islands being the chief purchasers; and Chinese brigs from Java occasionally visit Kissa. Although the natives are considered to be more industrious than the Amboynese, agriculture is not much pursued. Small plantations of Indian corn, tobacco, betel, and culinary vegetables, were met with near the villages. Wild nutmeg trees were abundant.

July 19.—The brig left this interesting group and returned to Banda. Two English seamen, who had been cast away in a brig on the coast of New Guinea, and after having been sold and resold

as slaves among the neighbouring islands, had been purchased and brought to Banda by the humane chief of Kissa, were received on board as seamen.

July 28.—The brig again left Banda, and on the 4th of the following month arrived at Babba, an island about midway between Banda and the north coast of Australia. Many years previously the Dutch had a settlement here, and the wands of office possessed at that time by the chiefs had been handed down to their descendants. The natives were at first shy and inclined to be hostile, but were soon brought into friendly communication with their visitors. The island is thinly populated, the shores only being inhabited. The natives resemble in most respects the pagan natives of the group last visited, but are far more barbarous, owing to their commerce being very limited. Their hair, which is naturally jet black, is rendered of a reddish flaxen colour by rubbing it constantly with lime Cultivation is little attended to, and the people derive the cocoa nuts, fruit, vegetables, and Indian corn, which they consume, from the adjacent island Wetang. Fishing and hunting are their chief occupations. Numbers of fine fish are to be obtained near the shore, and the interior abounds with wild cattle, hogs, and goats. An English brig, manned with ten Europeans, had arrived at Babba some time previous to the visit of the Dourga, and while one half of the small crew were on shore obtaining water, the brig was taken, plundered, and burnt, and the entire crew massacred.

August 15.—They left Babba, and continued their voyage to the Arru islands, where they arrived on the 27th. The Arru group consists of a number of moderately-sized islands, divided from each other by narrow straits. The land is moderately elevated, and many parts are covered with limestone rocks. An extensive coral reef lies before the east side of the group, and prevents a near approach by vessels of burden: on and about these reefs trepang and pearl oysters abound. The principal islands are Wamma, Wokam, Mykor, and Wadjia, all on the western part of the group; the three first are inhabited entirely by native Christians, the last by Mohammedans. Throughout the remainder of the group the majority of the natives are Pagans, but Christians and Mohammedans are mixed among them. The natives are Arafuras; their complexion is black, their hair long but strongly curled, and their stature about the middle size. They possess many of the characteristics both of the negro and of the brown races, and are probably a mixture: they live in villages containing about twenty small thatched houses, and great harmony prevails among them generally. Their food consists of sago, rice, maize, pumpkins, yams, fish, and pork. The customs of the Christian natives assimilate with those of Amboyna, and of the Mohammedans with

the Ceramese. Most of the former read and write Malay in the Roman character, and a number of young Amboynese Christian teachers, who have no other reward for their exertions than the gratification of doing good, are busily employed in instructing the rising generation and converting the Pagans. The natives of all sects are much addicted to the use of spirituous liquors, which are brought from Java in Chinese brigs.

Many anecdotes are given by M. Kolff illustrative of the amiable disposition of the Arafuras, and of the harmony which prevails in their communities. Their Orang Tuas, or elders of villages, are elected by the inhabitants, and are generally chosen from among those who are possessed of most wealth. They are fond of collecting brass trays and elephants' teeth, with which they adorn the interior of their houses, and an individual takes his station in society according to the number of these he may possess. Both these articles, which are the produce of foreign countries, are very expensive. The elephants' teeth are chiefly brought from Singapore by the Bugis, and the fact of the natives being enabled to purchase articles of such value speaks favourably for the commercial importance of the islands. These goods are apparently used as a circulating medium. On the occasion of the election of an Orang Tua, at which a Dutch gentleman was present, the youngest and unsuccessful candidate, though sorrowful on account of his defeat, expressed his satisfaction at possessing a sufficiency of this sort of wealth to enable him, whether Orang Tua or not, to assist any of his poorer fellow-villagers, should they fall into difficulties.

The trade of these islands is very extensive. The pearl banks are among the largest and most productive in the world; and trepang, so much sought for by the Chinese, is abundant, though not near so much so as on the north coast of Australia. This, indeed, is proved by the Bugis resorting to the latter place in such numbers to obtain it. The trade with the Arrus is carried on by several brigs from Sourabaya, in Java, by about thirty Bugis prahus, from Macassar, of the burthen of twenty-five to sixty tons, and by a multitude of small vessels which collect the produce of all the neighbouring islands. At the time of the arrival of the Dourga, the people of Banda and Amboyna had very little trade with the Arrus, as the Bugis could sell the British and Indian cotton cloths, iron, chopping-knives, &c., which they obtained from Singapore *via* Macassar, at a much cheaper rate than they could be supplied by the others.*

The productions of the Arrus, the articles given in exchange

* This state of affairs has been subsequently materially altered by the prohibition of the importation of British goods from Singapore, at the Dutch settlement of Macassar.

for them by foreigners, and the trade generally, resembles that of the group of islands north-east of Timor, but is far more extensive. From M. Kolff's description this is evidently one of the finest fields, both for the merchant and the missionary, which can be found in any part of the world.

Among the animals to be met with here is the *Pilandok*, or Arru rabbit, apparently a species of the kangaroo. It is larger than the common rabbit; head like that of a weazel, colour grey, fore feet very short, and each foot has three toes provided with strong nails. These animals generally sit upright on their hind legs, and do not run very fast. The natives tame them with facility, and allow them to run about their houses, from which they seldom wander. The flavour of their flesh is agreeable.

Sept. 8.—The brig left the Arrus, and on the following day arrived at Vordate, the northernmost of the Timor Laut group. It is visible at a distance of more than twenty-four miles: it is alternately hilly and level, and thus may easily be distinguished from the neighbouring islands, which possess a more generally level appearance. The following day they anchored near Larrat, opposite to a picturesque-looking village, situated on a hill near the sea. A number of trading prahus, built on the island, were hauled up on the beach, and covered with thatched sheds. The Dutch were well received by the natives: they are fairer than the generality of the natives of these parts, and their features bear a greater resemblance to those of Europeans than any of the natives of the Archipelago that M. Kolff had met with: they are Pagans. The commerce is similar to that of the neighbouring islands, and is considerable. The year previous to the visit of M. Kolff, an English brig, which had arrived on the south-east part of the island to obtain provisions, was captured by the natives, and the crew murdered, with the exception of two youths, who were saved by the women. One half of the crew were on shore at the time of the attack, and the two youths who were saved were with them. Some unsuccessful efforts were made by M. Kolff to obtain them. They were on the opposite side of the island.* The natives supposed the English to be the *Orang Gunung*, or inland and barbarous inhabitants of the country in which the Dutch occupied the sea-coast. This is by no means wonderful, when it is considered that the "meteor flag of Britain"

* This brig was probably the British colonial vessel Lady Nelson, which left the settlement on Melville Island to obtain provisions, and was never heard of afterwards. Many other instances have doubtless occurred in which our countrymen have been victims to our ignorance respecting these islands and their inhabitants. From a number of remarks scattered through this volume, there is every reason to believe that the British interests in this part of the world have by no means been placed on a better footing by the voyage of the Dourga.

never waved among these islands, except from the peak of some half-manned and, perhaps, distressed merchant vessel.

Sept. 30.—The Dourga left Timor Laut, and on the 8th of the following month arrived at Amboyna.

April 5, 1826.—The Dourga again left Banda on a voyage to New Guinea. The Arru Islands and Timor Laut were again visited, and the south-west coast of New Guinea was traced, but at too great a distance for it to be well examined. A more accurate survey of the coast was subsequently effected by the corvette Triton. M. Kolff gives the geographical positions of a few of the places visited during the last voyage; but these are not much to be depended upon, for the Triton, on board which vessel were several chronometers and some good observers, found his positions incorrect.

III.—*Voyage autour du monde sur la Corvette le Séniavine, en* 1826-29. *Par Frédéric Lütké, Capitaine de Vaisseau de la Marine. Imp. Russe. St. Petersburg,* 1835.

DURING the course of the last fifteen years not less than fifteen Russian ships of war have circumnavigated the globe; out of which voyages the narratives of four only have hitherto been made public—namely, that of the Vostok (Orient), Captain Bellingshausen, in 1819-21; the Ladoga, Captain A. Lazareff, in 1822-24; the Predpriatié (Enterprise), Captain Kotzebue, in 1823-26; and the voyage of which the following pages contain a brief analysis.

Sept. 1, 1826, the corvettes Séniavine, Captain Lütké, and Moller, Captain Stanioukovitch, of the Russian navy, left Cronstadt. After touching at Teneriffe and Rio de Janeiro, rounding Cape Horn (in lat. 61° S.), and calling at Conception and Valparaiso, the Séniavine crossed the Equator, going to the northward in 122° W. of Greenwich, and made no land till, on the 23rd June, 1827, she sighted Mount Edgecumbe, an extinct volcano rising 2800 feet above the sea, which marks the northern entrance into the Gulf of Sitkha, in the parallel of 57°, on the northern coast of America, and on the following day anchored off the settlement of Novo-Arkhangelsk, the residence of the Governor of the Russian colonies, whose jurisdiction extends over the Aleutian and Kurile islands, the population of which, in 1826, consisted of 5000 islanders and 3700 Americans; since the year 1792, the population had very materially decreased. This settlement contains about 800 persons, 400 of which are natives of the Aleutian

Isles. The Creoles, offspring of a Russian father and Aleutian mother, which, in 1830, amounted to 1000 persons, are a well-formed, active race of men. Fifteen vessels, with a burthen of 2000 tons belong to the port, and one vessel of 400 tons has been built here. A trade, chiefly in provisions, is kept up with Okhotsk, California, Sandwich Islands, &c.: fresh provisions, except fish, are very scarce. Here is a school for thirty Creole youths, who are educated at the public expense.

The mean height of the barometer during 1828-9 was 29.71; of the thermometer, + 6.15 of Réaumur, or 42½ of Fahr.

M. Lütké gives some curious details respecting the Kaloches, the people who inhabit the north-west coast of America, from the parallel of 40° to 60° N. lat., accompanied by some very characteristic sketches of them, by M. Postels, which give a far better idea of them than any description. (Plates 5 and 6.) He also states that one of the chiefs had voluntarily resolved to embrace Christianity.

Aug. 1.—The Séniavine sailed for Oonalaska. At *Iloaloak*, the principal place of this section of the Aleutian Isles, are about twelve Russians and twenty Aleutians. A very intelligent pastor, Father John Veniaminoff, who had resided here for many years, had translated the Catechism into the Aleutian language, printed at St. Petersburg in 1834, and had made many converts among the islanders, all of whom, indeed, profess Christianity, and since the time of Cook have much advanced in civilization. Twenty boys were at school here in 1827. Captain Lütké gives a short vocabulary of the language. The island will afford beef, vegetables and water—everything but wood. The climate is damp but not cold: mean temperature + 3.5 of Réaumur.

On quitting Oonalaska the Séniavine directed her course to the north-west, towards the islands Pribyloff and St. Matthew.

Sept. 1.—A lovely morning: discovered a magnificent panorama of all the land by which we were surrounded. To the eastward at the distance of sixty-five miles we saw the island of Oonimak with its enormous volcanoes; one of them, Chichaldinsk, whose form is that of a regular cone, appeared at this distance entirely isolated; a whitish smoke arose from its summit, which we determined to be 8083 English feet above the sea. The volcano of Makouchinsk, on the island of Oonalaska, whose flattened summit has only some sharp peaks at its western end, does not offer so striking an aspect as the volcanoes of Oonimak. Smoke rose from a plateau covered with snow; its elevation, according to our measurements, is 5491 feet, and the height of the limit of snow on the mountain 3517 feet. Dr. Chamisso states it at from 2000 to 2500 feet; but the island of Akoutane, whose height we found to be 3337 feet, was entirely free from snow.

The following morning we saw the island of St. George, the aspect of which is very uniform: its height above the sea may be 300 feet.

The islands of St. George, St. Paul, and some other small ones belonging to this group, are generally called the Pribyloff Islands, after the name of the pilot who discovered them in 1786. The island of St. Paul is volcanic, to judge by the great quantity of lava and pumice-stone found there; St. George, on the contrary, is composed of granite and gneiss. They are both covered with moss, but destitute of wood. On St. Paul are now eleven Russians and 150 Aleutians; on St. George, six Russians and seventy-five Aleutians.

The chief occupation of the inhabitants of this group is in hunting sea-otters, sea-lions, and seals; and in the forty-two years since their discovery more than three millions of sea-bear skins have been taken; such indiscriminate slaughter, as might have been expected, has nearly annihilated these animals on the Pribyloff Islands.

St. Matthew Island, so named by Lieutenant Sindt in 1766, and afterwards Gore Island by Cook in 1778, who determined its position, is twenty-eight miles long from N.W. to S.E.; its southern point, Cape Upright of Cook, is in 60° 18′ N. 172° 4′ W. of Greenwich; it is composed of hills of moderate height, separated by deep valleys, which at a distance give it the appearance of several islands. Pinnacle Island, sixteen miles and a half to the W.S.W. of Cape Upright, rises 300 feet above the sea to a crest so sharp that a bird only could perch on it. On St. Matthew, in 1809, was found micaceous schist, iron pyrites, silicious stones, and fragments of stone dispersed over the island, showing traces of volcanic action. Cape Upright shows distinct stratification. No wood is found here.

The autumn approaching, the Séniavine steered for Kamtchatka, touching at Behring Island, where were found 110 inhabitants, Russians, Creoles, and Aleutians.

Sept. 24.—Made for the bay of Avatcha, and owing to the thickness of the fog only saw the snowy summit of the volcano of *Vilioutchinsk*, which, as a phantom, appeared and disappeared several times in the course of the day, and on the following day anchored in the harbour of Petro-pavlofsky, where she remained till the end of October.

Nov. 1.—Sailed for the Caroline Islands: in our route we passed over (lat. 28° 9′, long. 128° W.) the position assigned in the American charts to the island of *Colunas,* and sought an entire day for it in that parallel, but in vain. We sought in like manner for Dexter Island and St. Bartholomew without more success.

Dec. 4.—We discovered the island of *Ualan* in the west, at the

distance of forty-five miles, and on the 10th anchored in the harbour of the Coquille, where we remained three weeks.

CAROLINE ISLANDS.—With this extensive group of islands, reaching between the parallels of $3\frac{1}{2}°$ and $9\frac{1}{2}°$ north, over nearly 30° of longitude, from Current Island, or Pulo Anna, on the west, to Ualan on the east, we were very imperfectly acquainted in detail till shortly previous to this voyage, when Captain Duperrey, in the Coquille, in 1824, ran through their whole extent from east to west, discovering many small islands, and surveying in detail the island of Ualan. However, in this great space he left an ample harvest for the Russian navigator, who, in his subsequent examination of this group, followed a regular plan, visiting each group of islands and each island belonging to this archipelago, and thus obtaining a complete acquaintance with their geographical position, and much information relative to the manners and customs of their inhabitants, and a short vocabulary of their language; also an account of the structure and natural history of the islands, from the observations of the naturalists of the expedition, M. Alexandre Postels, Dr. Mertens, and the Baron Kittlitz.

Ualan.—The easternmost of this group is 24 miles in circumference; a valley between two masses of mountains stretching from east to west, divides the island into two unequal parts, of which the southern is more than double that to the north. On the latter rises Mount Buache, 1854 feet above the sea. To the south Mount Crozer has an elevation of 1867 feet. With the exception of the peaks on the latter, the whole island from the sea to the summit is covered with wood overrun with climbing plants; streams of water abound in all directions. Yet with all this moisture the climate does not seem to be unhealthy; the population as given by one of the chiefs about 800, without counting children. The people are rather below the middle size, well made but slight—hospitable, peaceful, and kind in their manners. The *Urosses*, or chiefs, reside all together in one small town; they are implicitly obeyed by the people—they have no musical instruments—the colour of the skin of both sexes is chestnut—the women not pretty—they bore the lobes of their ears and insert bouquets of flowers and odoriferous herbs full two inches in thickness; yet, as a singular contrast to this simple and elegant taste, they are extremely dirty, and constantly devour the vermin from their persons—they wear a necklace, or rather bolster, from four to five inches thick, made of the cocoa-nut fibres—the women are prohibited from dancing. Both sexes anoint the body with oil, and tatoo themselves irregularly; their pirogues are from 25 to 30 feet long, made out of a single breadfruit tree.

Their ideas of religion, from want of understanding their language, were not easily to be comprehended. They appeared to

venerate a deity named *Sitel-Mazuenziap;* possibly a deified chieftain who, they said, had two wives and four children; but neither temples, moraïs, nor idols were erected to him. In one corner of each house was placed a thin wand from four to five feet long, as a sort of household god, to whom offerings were made; and occasionally some ceremony was gone through which was considered religious. Captain Lütké thinks there are traces in their language and ceremonies of communication with the Japanese.

Ualan would serve as an excellent place of refreshment for whalers cruising in these seas. A fair harbour, a good climate, and a mild people—abundance of water, fruit, and fish, with some birds—no animal food; but some pigs left by the Séniavine may, at a future day, supply shipping with pork. The centre of the island is situated in 5° 19′ N., 163° 6′ E. of Greenwich.

January 4th, 1828, the Séniavine crossed the magnetic equator in 4° 7′ lat., 162° 57′ E. long. On the 10th sought in vain for two small islands, marked on Arrowsmith's chart in 5° 12′ N. long., 160° 55′ E.; and on the 13th, with as little success, the Musgrave islands, in Krusenstein's chart in 6° 12′ N., 159° 15′ E. At daylight on the 14th, much to their surprise, they discovered a large and lofty island close ahead; this, although lying close to the tracks of Tompson, Duperrey, and several others, had never yet been noticed. On examination, it proved to be the group now named Séniavine, consisting of three groups, extending between 6° 43′ and 7° 6′ N. lat. and 158° and 158½° E. long. *Pouynipete,* the chief island, is nearly circular, and 50 miles in circuit. Its culminating point, Monte Santo, rises 2861 feet above the sea;* the N.W. cape of the island is remarkable by a precipitous basaltic rock about 1000 feet high. On the southern coast is a distinct mass of isolated basalt resembling a lighthouse. The island is surrounded, to the distance of two miles, by a coral reef, within which are many small islets. Pouynipete is covered with verdure; few habitations are visible along the coast, but to judge from the numerous canoes that came off to the ship, the population cannot be less than 2000. The natives differ from those of Ualan, and approach more nearly to the Papuas; they are a small race of men, but fierce and resolute in their actions. The group *Andema,* lies 12 miles to the S.W., and *Kapenuare* 20 miles to the N.W. of Pouynipete, each surrounded by a coral reef. In lat. 7° 18′, long. 158° 6′, we searched for the island of St. Augustin, of Captain Freycinet's chart, but without success. January 24,† in lat. 5° 47½′, long. 157° 30′, we saw

* Visible 65 miles.—Ed.

† It must be observed that there is the difference of twelve days, from old to new style, between the text and the chart of the Caroline Islands throughout.—Ed.

Los Valientes, of Tompson in 1772 (*Nyaryk* of the natives), eight low coral islands, 22 miles in circuit—with, apparently, a population of only 30 people. February 3. Examined the group of *Matlock* islands (1795), *Lugunor* of the natives, composed of three groups of coral islands, 90 in number. Lugunor, the most eastern group, is 18 miles in circuit. February 14. Determined the island *Quirosa* of the Spanish pilot, and *Hogoleu*, of Duperrey, to be called by the natives *Houg*. February 16. Examined the island marked *Anonymous* on our maps, and found it to be inhabited, and to be the eastern islet, named *Piserar*, of a coral group 45 miles in extent, connected by a reef, and called *Namonuito*: from this place the Séniavine went to *Guahan*, of the Marianne islands, for provisions and water, and to refit. March 20. Returned to the Caroline islands, and examined the group of Swede's island, or *Namourak*; thence to the westward to the group *Faroilap*, *Ifalouk*, and *Ouleai* (the 13 isles of Wilson), composed of 22 islands, and 15 miles in circuit. April 9. The Séniavine made sail for Kamtchatka, touched at the islands of *Bonin-Sima*, a basaltic group not exceeding 900 feet in height, surveyed the year previous by Captain Beechey, and again anchored at Petro-pavlofsky, whence, after a stay of three weeks, the corvette steered along the coast to the N.E., fixing the positions of the various capes and headlands, which differed much from all former charts. On the morning of the 28th June, "we saw at once the volcanoes of Avatchinsky, Koriatsky, Joupanoff, and Kronotsky, the two former at 82 miles, the latter at 68 miles' distance. Kronotsky, like Villioutchinsky, has the form of a regular cone, but seems rather less steep than the latter. On its left is a flat-topped mountain, and close to it a sharp peak, probably the same that were shaken at the time of the passage of the mountain Chevalutsk from its former to its present position.* The altitude of Kronotsky, carefully taken, made the elevation of this extinct volcano 10,610 feet above the sea, or a little higher than Etna. We now saw it at a distance of 95 miles, and on our return at 120 miles, very distinctly. Beyond Cape Kronotsky mountains began to show themselves in the distance towards the north, among which it was not difficult to recognize the gigantic volcano of *Kamchatskoi*. At the enormous distance of 104 miles it subtended an angle of 50¼'. The measurement was very exactly made, whence it results that its height is 16,512 feet.† Its form is that of a cone slightly truncated." July 5. Examined the island of *Karaghinsky*, which, with the adjoining coast, had not been seen by any known navigator except Sindt. Behring only saw one point through a fog: it is hardly necessary to say that

* See Description of Kamtchatka by Kracheninnickoff.
† Dr. Erman found its height to be 15,766 English feet.

its outline on the maps had no shadow of resemblance. This island was inhabited by upwards of 100 Koriaks in the middle of the last century; it is now quite abandoned. Here in the parallel of 60°, at Cape Ilpinsky, is the lowest and narrowest part of the isthmus, about 70 miles wide, which forms the northern limit of the peninsula of Kamtchatka; the mountains lose themselves in small hills. From this point the corvette steered direct for Behring's Strait, and on the 28th anchored in the bay of St. Lawrence, only 30 miles to the southward of the east cape of Asia, and in lat. 65° 36′,—the most northern point reached. During a week's stay they saw much of the Chukchis, and found them a friendly, good-natured, dirty people. Returning to the southward, they discovered the Strait Séniavine in 64° 45′ N. between two islands and the mainland, forming excellent ports: the surrounding mountains are steep, but do not rise above 1500 feet—they assume a circular form, and are chiefly of syenite. From the bay of St. Lawrence they stood to the westward into the gulf of *Anadyr*, and surveyed the bay of St. Croix, which extends north and south upwards of 60 miles: at the bottom of the bay a lofty mountain chain extends in an east and west direction, doubtless connected with the principal chain of this continent; one of its most remarkable points, *Matatchiugai*, rises 8615 feet. Here were no traces of petrifactions, or of recent volcanic action.

The whole of the 11th chapter of Captain Lütké's narrative is devoted to a detailed and very interesting description of the Chukchis, the race who inhabit the north-eastern extremity of Asia, but which we regret that we have not space to extract. He is of opinion that they are far from being the turbulent people they have been described by authors. The description is rendered doubly valuable from being illustrated by excellent portraits of the natives, by M. Postels. (*See* plates 33 and 34.)

The peninsula of Kamtchatka, as is well known, is celebrated for its volcanoes, or *Sopki;* between the parallels of Cape Lopatka (51° 3′ N.) and the bay of Avatcha (53°) five isolated and conical summits, some still emitting smoke, rise proudly above the rugged chain of mountains which stretch in a N.E. and S.W. direction. To the N.E. of the bay of Avatcha, as far as the parallel 56½°, eight other volcanoes are occasionally active. Of these thirteen Sopki, all the names, and some of the heights, are given, as determined by Captain Lütké:—

	Lat. N. °	′	Height in Eng. feet.
Vilutchinskaïa - -	52	43½	- 6750*
Avatchinskaïa - -	53	17	- 8760

* Beechey, in 1826, made it 7374.—See *Blossom's Voyage*, vol. ii. p. 668.

	Lat. N. ° ′		Height in Eng. feet.
Koriatskaïa	53	19	11215
Jupanovskaïa	53	35½	9060
Kronotskaïa	54	8	10625
Klutchefskaïa	56	8	16512

The greater part of these volcanoes are on the eastern side of the peninsula, and nearly in a direct south-west and north-east line. From the promontory Lopatka the Kurile Isles stretch in the same south-west direction; and in this chain are found eight volcanoes, some of which are active, and thus this series extends over nearly ten degrees of latitude, and perhaps is connected with the Japanese islands, in which we know there are volcanoes in activity.

After five weeks spent in the harbour of Peter and Paul, the Séniavine sailed on the 11th of November for Manila, reconnoitring on her way those of the Caroline Islands which she had not before visited; and, in an able summary in the 13th chapter, the population of the whole group is estimated at 9000 persons.

Dec. 10.—Discovered and examined the group *Mourileu*, composed of nine islands, surrounded by a coral reef, lying in a north-east and south-west direction, for forty miles: its centre in latitude 8° 40′ N., long. 152° 8′ E.

Dec. 20.—Sighted the coral island of *Feis*, and the following day made the Mackenzie Islands (*Uluthy* of the natives), composed of two groups—one of five islets, uninhabited; the other of twenty-five islands, on one of which *(Falalep)*, a century ago, the Spanish Jesuit Padre Cantova planted a mission, and on the neighbouring isle of *Mogmoy*, in 1732, fell a martyr to his zeal. Unfortunately time would not permit the Séniavine to go to this island, *although in sight*, to learn, after the lapse of a century, what had been the result of the missionary's devotedness—an object, one would imagine, well worth the delay of a few days or even of a week. On the following day the Séniavine shaped her course for Manila, where she arrived on the 13th of January, and ultimately at Cronstadt in September, 1829, after an absence of three years and five days.

The chief results of this expedition are—

In *Geography*.—The determination of the positions of the chief points on the eastern coast of Kamtchatka, of the country of the Koriaks and of the Chukchis, from the bay of Avatcha to the north-east point of Asia; also of the islands Karaghinsk, St. Matthew, Pribyloff, &c., in Behring's Sea.—The archipelago of the Carolines examined, from the island of Ualan on the east, to the group of Uluthy on the west, twelve islands discovered; and twenty-six detached groups or islands described; as also the

islands of Bonin-Sima.—The corvette Moller, consort of the Séniavine, had in the mean time discovered *Moller* island, in 25° 46′ N., 171° 50′ W., and examined the chain of islands and reefs which extend north-west from the Sandwich islands. She discovered also a dangerous reef six miles S.S.W. of *Lisiansky Isle;* and afterwards surveyed the north-western shore of the peninsula of *Aliaska.* The geographical portion is illustrated by various plans, charts, views of headlands, &c.; and especially an excellent chart of Behring's Sea.

In *Physics.*—Experiments with the invariable pendulum, made at nine stations: magnetic experiments; hourly observations on the barometer and thermometer.

In *Natural History.*—Rich collections in each branch of zoology, including 300 species of birds, 300 of fish, 700 of insects, and 150 crustaceæ.—In Botany, 2,500 specimens of dried plants; and of *algæ.*—In Mineralogy, 330 specimens of rocks, from the various points touched at by the corvette.

In *Ethnography.*—A vocabulary of upwards of 200 words and phrases, besides the numerals, in four dialects of the language of the Caroline Islands, compared with several other dialects of Polynesia; also descriptions and *portraits* of the *Chukchis,* the *Koriaks,* the natives of the *Caroline* groups, &c. &c., and one *Bughi,* of the Celebes, the only published portrait, that we are aware of, of this little known people: a collection of costumes, arms, ornaments, &c.

In the course of the voyage 1250 drawings have been made; some of which give an excellent idea of the characteristic vegetation of a tropical clime.

The third volume of the work is the joint production of Dr. Mertens, M. Postels, and Baron Kittlitz, naturalists to the expedition, and contains much valuable information on geology and natural history.—May every expedition for discovery that leaves Europe be supplied with as zealous naturalists as those embarked on board the Séniavine!

We have the gratification to add, that for this voyage, the Demidoff premium has, by the Academy of Sciences at St. Petersburg, been conferred upon Captain (now Rear-Admiral) Lütké.

IV.—*Verhaal nan eene Reize naar en langs de zuid-west kust van Nieuw-Guinea, gedaan in* 1828, *door Z. M. Corvet Triton, en Z. M. Coloniale schoener de Iris, door* J. MODERA, *Lieut. ter Zee, van de tweede Klasse.* Haarlem, 1830.

Narrative of a Voyage along the S.W. Coast of New Guinea, in 1828, *and communicated by* G. WINDSOR EARL, Esq., M.R.A.S.

IN the dearth of information respecting the vast island of New Guinea, extending from the Equator to 10° S. lat., and reaching in a N.W. and S.E. direction not less than 1200 geographical miles, or double the length of the British Islands, we are glad to avail ourselves of the account of a voyage undertaken by order of the Netherlands Government, to establish a settlement on some convenient spot on the W. coast of the island, and during which voyage the greater portion of the S.W. coast was surveyed, the general trending only of which had been previously ascertained.

A brief sketch of the progress of discovery on these shores may furnish a suitable introduction to this voyage. The Portuguese claim the discovery of New Guinea for Abreu and Serrano, who were despatched from Malacca to the Spice Islands, by Albuquerque, in 1511. Abreu, however, proceeded no farther than Amboyna, and Serrano was wrecked on one of the neighbouring islands; so that it is not likely that either of them could have discovered New Guinea, although they might have heard of its existence from the natives of Amboyna. The discovery may, with more justice, be attributed to Alvaro de Saavedra, who was sent from the Moluccas on a voyage of discovery to the eastward in 1527. Many of the bays and headlands on the north coast were named by the Portuguese, and these were retained in a Dutch chart published at Amsterdam as late as 1753. In 1537, the north coast was visited by Grijalva and Alvarado, two Spaniards, who had been sent on discovery from Mexico by Cortez; and again, in 1567, by Mendaña, who, in 1595, attempted to colonize the island of Santa Cruz, 18° to the eastward of New Guinea, but the settlement was broken up at his death.

The above-mentioned voyages were confined to the north coast. In 1606, ten years after their arrival in the Indian Archipelago, the Dutch despatched a vessel, called the Duyfhen, from Bantam to New Guinea. She passed along the south-west coast, and stretched across to Australia, which was considered to be merely a continuation of the coast of New Guinea. In the same year, Torres, after having separated from Quiros, near Vera Cruz, passed between New Guinea and Australia; thus discovering the strait which bears his name. In 1616, the north coast was traced by Schouten and Le Maire, and several Dutch navigators followed

the track of the Duyfhen; Carstens in 1623, Gerard Pool in 1636, and Tasman (second voyage) in 1644. Carstens and Pool were both killed by the natives of New Guinea, and as two rivers on the north-west coast are named in the old charts *Doodslager's*, or "Murderers'" Rivers, they probably met their death in the vicinity. The positions assigned to these rivers agree pretty well with the Utanata and False Utanata rivers visited by the Triton. All these last-named navigators fell into the same error as the people of the Duyfhen in supposing that New Guinea was united to Australia; and these countries were thus represented in all charts published previous to the year 1762, when an original letter of Torres, describing his proceedings after parting with Quiros, was found by the British at the taking of Manilla.*

It does not appear that any voyager of note comes between Tasman and Dampier, although the west coast was probably sometimes visited by the Dutch. In 1700, Dampier, in the Roebuck, touched at Sabuda Island, near the west coast of New Guinea; and, passing through the strait between Wayjiu and Battanta, sailed round New Britain, and discovered the strait which divides it from New Guinea. He then passed to the westward, along the north coast of the latter island. Roggeveen, Carteret, and Bougainville, subsequently pursued nearly the same track along the north coast. Cook touched on the south-west coast in 1770, but he remained a very short time, and had no friendly communication with the natives.

In 1774, Captain Forest, E.I.C.S., performed a voyage from Balambangan to New Guinea, visiting Dori Harbour at the north-west end; and, from his being able to converse with the natives through his knowledge of the Malay language, his narrative, although little more than a single chapter is devoted to the mainland of New Guinea, contains more correct information, particularly concerning the manners and customs of the natives, than any work published previous to the voyage of the Triton.† In 1791, Lieutenant M'Cluer, of the Indian navy, surveyed the north-west and part of the western coasts, and discovered the deep inlet which nearly divides the north-west end of the island. His charts only have been published. Several French navigators, among whom are D'Entrecasteaux, Duperrey, and D'Urville, have also visited the eastern and northern coasts.

It now remains to mention the parts of New Guinea which have been well surveyed, and those which are yet to be examined.

* By Dalrymple, and published in his Collection of Voyages to the South Seas.

† An account of a voyage to New Guinea, by M. Sonnerat, had been published in Paris a few years before the appearance of Forest's work: but the latter states that M. Sonnerat went no farther than Gibbi, an island near the east end of Gilolo. M. Sonnerat does not say precisely where he went to.

The north-west and western coasts, from the Cape of Good Hope to the south point of M'Cluer's Inlet, have been surveyed by Lieutenant M'Cluer. From this point, southward, to the Fort Du Bus, in lat. 3° 41′ S., an extent of about 170 miles, the shore is much broken, and has only been indistinctly seen. The southern coast, from Fort Du Bus to Dourga Strait, has been surveyed by the Triton; and, in 1835, Lieutenant Kool, of the Dutch navy, passed through the above-named strait, and thus determined what had only been suspected by the people of the Triton, that the land about Cape Valsche (False Cape) is an island. Between the south entrance of the strait, or what has hitherto been termed the Bartholomew River, and the eastern boundary of the territory taken possession of by the Dutch (in long. 141° E.), an extent of 140 miles, the land has not even been seen. Of the remainder of the south coast little is known; and it cannot be determined whether the detached pieces of land seen by the Hormuzeer and other ships, when passing Torres Straits, are actually portions of the mainland, or merely islands lying near it, —a point of immense importance, when the great danger attending the navigation of Torres Straits is taken into consideration.

We are indebted to French navigators—to D'Entrecasteaux, and especially to Duperrey, in 1825, and Dumont D'Urville, in 1827, for the chief part of the knowledge we possess of the north-east coast. The positions of many headlands have been determined; but 400 miles of the north-eastern coast-line, between Port Geelvink on the north, and Cape Rodney to the south-east, remain to be thoroughly examined. Geelvink's, or the Great Bay, has been surveyed by the Dutch, and a chart of their discoveries, from which we have our knowledge of the bay, was published by Dalrymple.

April 21, 1828, the corvette Triton, and the Colonial schooner Iris, left the Bay of Amboyna, and shaped their course for Banda, where they were to obtain interpreters, and on the 29th, their wants being supplied, they continued their voyage. The following day, being driven to the south-west of Banda, they saw Bird Island;* the position of which they found to differ considerably from that assigned to it in the charts of Norie and Arrowsmith, which they had on board, together with one constructed by M. Kolff, in 1825. On the 4th of May, they passed through the group of islands which stretch from the Keys to Ceram, and which, until then, formed the eastern boundary of the Dutch Oriental possessions. The people of these islands carry on a trade with the south-west coast of New Guinea. May 7, they entered the channel be-

* For geographical positions, see the annexed Table.

tween the Key and Arrú islands; and, on the 20th, made the coast of New Guinea, in lat. 7° 15′ S. The following day the vessels entered the Dourga Strait,* the north-west entrance of which had been discovered by M. Kolff in 1825, and anchored off the mouth of a creek on the north shore. As the stock of fresh water began to run short, a boat was despatched to the creek; but as it was high water when they entered it, the water was brackish. The banks were low and morassy, the water standing upon it to the depth of two or three feet. The whole of the coast, indeed, that they had hitherto seen, was but little raised above the level of high-water mark; the trees with which the land was overgrown presented a level appearance, and not a single hill or piece of elevated land was visible.

The following day several natives were seen near the mouth of the creek, and a boat was sent to them from the corvette; and after having friendly communication for some time a quarrel occurred, in which three of the natives were killed, and some of the boat's crew wounded. These people were of the middle size, and not very stout. Their skins were black, with a bluish gloss, and some were afflicted with ulcers, and a disease which gave a scaly appearance to their skin. They had thick lips, flat noses, black frizzled hair like that of negroes, beards and whiskers. Some had marks drawn with red pigment across the face and round the mouth. The lobes of their ears were pierced, and in them they wore rings of rattan. The men were entirely naked, with the exception of a broad band of rushes round their waists, the ends hanging down behind. Their weapons were bows, arrows, and spears, made of different kinds of cane, with points of wood hardened by fire. The two women whom they saw wore small triangular pieces of bark hanging down before them. They did not approach sufficiently near to be well observed, but their appearance was by no means prepossessing.

The vessels now proceeded about twenty-five miles further up the strait, the shores still being extremely low, and no high land could be seen even from the mast-head. Parties landed in various spots, where they met with no inhabitants. On digging pits they found the upper stratum of black vegetable earth to be only one foot thick: under this was a layer of grey clay from three to five feet in thickness, which rested on brown coral sand. Pieces of quartz, ironstone, and pumice-stone were found scattered about on the beach. No place adapted for the settlement having been met with, the vessels left the strait, and proceeded along shore to the N.W.

May 28. They saw a village in latitude 6° 17′ S., the same

* It is called the Dourga *River* by M. Modera, as it was not correctly ascertained to be a strait until the schooner Postilion passed through it in 1835.

that was seen by Cook during his first voyage. On the 29th a shoal was met with, in latitude 6° S., and on the following day the Providential Bank was seen.

June 2. After having traced the coast for 230 miles to the north-west of Dourga Strait, the vessels anchored off the mouth of False Utanata river, in latitude 4° 48′ S. A bar of sand, on which there was a heavy surf, ran across the mouth of the river. Numbers of natives were seen on the beach, waving white flags, and several canoes were launched by them; but although the vessels remained on and off several days, they did not communicate with the natives, owing to a want of confidence on both sides. Men were occasionally seen on the beach, waiving short pieces of wood in the air, from which issued something resembling smoke, instruments which puzzled Cook's people so much, and made them suppose that the natives possessed fire-arms.* These they afterwards found to be short pieces of bamboo, which contained a mixture of lime, sand, and ashes, and which was ejected by swinging the instruments in the air. They were apparently used for the purpose of making signals to their friends at a distance.

June 8. They pursued their voyage to the north-west, and on the following day a number of people belonging to a river some distance to the westward came off to the vessels in canoes. They readily bartered their weapons and ornaments for pieces of cloth, old clothes, knife blades, beads, and empty bottles; but the two former articles were most in demand. The chiefs were dressed somewhat in the Malay fashion, which proved that they had had communication with the Ceramese. On the 11th the vessels arrived at the river to which these people belonged. It was called the Utanata river, and bore much resemblance to the False Utanata. They remained here until the 22nd in uninterrupted harmony with the natives, who assisted them in cutting wood and filling up water. The natives here differed little from the people of Dourga Strait, except in being of superior make and stature (the majority were above the middle size), and somewhat further advanced in civilization. Each of the natives appeared to wish to ornament himself in a manner different from his neighbour. They wore rings of rattan and strings of hogs'-teeth on their necks, arms, and legs, and many had the cartilages of their noses bored, wearing pieces of stick or bone in the aperture. Their teeth were generally sharpened to points. The men had wales across their breasts and bellies, and on their arms. These had been made by cutting the flesh with stones, and afterwards burning it, so that when the wounds healed, wales were raised to

* In Cook's Voyages it is stated that fire as well as smoke issued from these weapons, as they were supposed to be.

the thickness of the finger.* The greater portion of them resided in one long house, 100 feet in length, 5 feet high, and 6 broad, situated on the shore, within the mouth of the river. It contained nineteen doors, one for each family. The frame was constructed of bamboo, and the walls and roof were covered with thatch. Their canoes were from thirty to sixty feet long, and the men stood up to row. Their weapons consisted of bows, arrows, spears, and clubs, which last, together with their paddles, were handsomely carved. Their domestic animals consisted of hogs and dogs, but their food was chiefly sago, fish, and turtles' eggs. They possessed also plantains, cocoa-nuts, papayas, nutmegs, breadfruit, and large lemons, which they readily gave in exchange for cloth. To judge from the report of one of the chiefs, who named no less than thirty-five villages in his neighbourhood, the population must be considerable. The natives, on hearing that the Dutch were about to settle on the coast, were anxious that they should fix themselves here: but as the river, although clear and capacious inside the heads, had a bar across the entrance, which rendered it difficult of access to ships of burden, their offer was declined. The coast hitherto had been extremely low; but here a range of high mountains, generally enveloped in clouds, and on which some thought they could distinguish snow, appeared far in the interior, running nearly east and west, one end of the range terminating in Cape Bouro, a bluff promontory about eighty miles to the W.N.W. of the Utanata river.

June 22. The vessels left the river, and pursued their voyage. On the 27th they saw a number of high islands, close to the coast, and entered a strait between one of them and the mainland, where they were boarded by the chief of the island *Aiduma*, who conducted them to a small cove on the north part of it, on the shores of which his village was situated. At the head of the cove a beautiful and fertile valley, bounded on each side by steep hills, stretched towards the interior. In it was a Malay house, which several years previously had been occupied by a Ceramese priest, who had converted the natives to Mohammedanism. The Dutch had some thought of making their settlement here, but they found that the fort would be overlooked from the hills on each side of the valley, and would therefore be insecure. Several beautiful valleys, both on the mainland and on the adjacent islands, were examined and disapproved of for the same reason. At length, an extensive piece of marshy ground, at the bottom of a large land-locked bay on the mainland, was fixed on for the site of the fort, and a party from each vessel, together with the intended garrison, commenced clearing away the thick forest, and

* In this and in many other of their customs, and also in their general appearance, they bear a striking resemblance to the natives of Australia.

erecting the buildings, the natives bringing them abundance of bamboos and thatch. Two officers were sent to survey the neighbouring coasts, and towards the end of August the fort, which was merely a square enclosure of stakes, surrounding a few huts, was completed; but by this time the greater portion of the crew were laid up with the jungle fever, which was caused by the extreme insalubrity of the position. The marshy ground on which the fort was built, and which, owing to the denseness of the forest, (previous to its being cleared,) had never been reached by the sun, engendered miasma, not readily dissipated by the wind, as the bay, from being perfectly land-locked, was sheltered from the sea breeze.

Immediately behind the fort rose a wooded mountain to a height of 2462 English feet. The soil in the vicinity was very rich, and many of the vegetable productions were of a valuable description. Among these were the Massoy trees, the bark of which is much valued by the people of the Archipelago, and is often used medicinally. Iron wood and ebony were found in great abundance, some of the trees being five feet in diameter: sago and cocoa-nut trees, with other palms were also numerous; together with plantains, lemons, papayas, nutmegs, jamboes, pumpkins, and yams. Several species of the kangaroo were met with, together with birds of paradise, crown pigeons, kingfishers, and other birds. It was ascertained that cassowaries also existed on the island. The sea abounded with fish, and alligators occasionally made their appearance in the bay.

The high islands near this part of the coast appeared to have been separated from the mainland by a convulsion of nature. Two shocks of an earthquake were felt while the vessels were leaving the harbour to return.*

Two different races of people inhabited this part of the island, the Papuas, or negroes, who occupied the coast, and the Arafuras, or inhabitants of the interior, the latter being under a sort of subjection to the former. The inhabitants of the coast and the adjacent islands were inferior in stature and personal appearance to the people of Utanata, who were the finest race of men met with on the coast. In other respects there was little difference between them, except that the people near the settlement, from having had more communication with the Ceramese, had abandoned many of their own customs, and adopted those of their visitors. Their chiefs dressed in the Malay fashion, but the poorer classes wore no other dress than a piece of cloth, sometimes made of the husk of the cocoa-nut, wrapped round the waist, one end being brought between the legs, and fastened be-

* Schouten and Lemaire experienced a severe shock of an earthquake while sailing along the north coast. New Guinea contains several volcanoes.

hind. Many wore bracelets of beads and strings of hogs'-teeth, but none had their noses bored. Their woolly hair was frizzed out by means of a bamboo comb. The women were very seldom seen.

No data are given from which we can learn the exact amount of population; but to judge from the number of villages mentioned, it must be greater than one would be led to expect, when the state of society is taken into consideration. Slavery, the curse of their race, works as great evils here as on the coast of Africa, the various tribes frequently making war upon each other to obtain captives to dispose of to the Ceramese and Macassars. A short time before the arrival of the vessels, a warlike people, inhabiting the coast to the N.W., surprised a village on the shores of the bay in which the Dutch settlement was made. Most of the men were killed, but the women and children were taken into captivity, and the village was burned. The friends of the sufferers generally in their turn make reprisals on their weaker neighbours.

The chiefs of Utanata informed the voyagers of the number of rivers and villages in their neighbourhood, with their respective names. To the eastward of Utanata, in the district of Timakawa, or Timoraka, were four rivers and seven villages, and in the district of Koyway, which extended from the Utanata river to the island of Lakahia, were three rivers and twenty-eight villages. To judge from the village at the mouth of the Utanata, which was inhabited by about twenty families, these villages should each have a population of at least eighty individuals; indeed, their numbers could scarcely be less when it is taken into consideration that they were liable to attacks from enemies. Thus we may suppose that the coast from Utanata to Lakahia Island, an extent of rather less than 100 miles, contained 2240 inhabitants. It was stated by the chiefs that the Arafura tribes in the interior were more numerous than the Papuas on the coast.

The king of Tidor claimed the sovereignty of several districts on the west coast of New Guinea, and nearly all the rajahs, or head chiefs, had their titles confirmed by him.

Punishment of death, which once obtained, has been abolished. Offenders forfeit the whole or part of their property; and a portion of the confiscated goods falls to the lot of the chief, or elder, who has passed sentence on the criminal.

The Mohammedan religion is professed by the entire population of the coast in the neighbourhood of the fort; and the marriage and funeral ceremonies are similar to those of the Ceramese. On some occasions, after the expiration of a year from the time of the funeral, the bones are disinterred, when a feast is held over them, and they are again consigned to the grave. This

is probably a relict of their old customs. Their prahus are from fifteen to thirty feet long: some are roofed over, and the families of the owners reside in them. The Papuas carry on a brisk trade with the Ceramese, who arrive on the coast at the commencement of the north-west monsoon, and remain six months. The articles obtained here are massoy bark, rosamala and belishary—(odoriferous woods, which, as well as massoy, are used medicinally)—pearls, nutmegs, trepang, birds of paradise, and edible birds' nests; in exchange for which they receive bar iron, parangs or chopping-knives, knife blades, brass wire, and flowered calicoes. Owing to this communication the natives have acquired some knowledge of the Ceramese language (a dialect of the Malay), through the medium of which they conversed with the interpreters who accompanied the expedition.

It does not distinctly appear whether the Dutch had any personal communication with the Arafuras; neither is it mentioned whether the people have straight hair and brown complexions, like the Arafuras in the interior of Magindano, Ceram, and Gilolo, or woolly hair, like the Papuas. Probably the latter are averse to strangers having communication with these Arafuras; for Forest, during his visit to the north coast of New Guinea, met with none of them; but he was informed by an intelligent Malay, who had seen them, that some have straight and others woolly hair. A short account of the Arafuras in the vicinity of Fort du Bus, is given by M. Modera, on the authority of one of the Papua chiefs. Their stature is greater than that of the Papuas, and they are also more numerous. Their marriage ceremonies are of a very primitive description. When a young couple form any attachment, they fly into the forest, and remain concealed until an arrangement is made between their respective parents. Should not this take place the parties separate on their return to their homes, and each is at liberty to form a new connexion.

On the death of an individual the body is washed and enveloped in cloth, made from the bark of a tree, or the husk of the cocoa-nut. After which the relatives assemble, and make known the affection they bore the deceased by howls and lamentations. A scaffold of bamboos is then erected, on which the body is laid, and a fire is lighted under it, and carefully kept up until the moisture of the body is entirely evaporated. It is then laid in a sort of loft, close under the roof of their dwelling, where it is watched by the children belonging to the family, while the relatives feast in the house for seven days. After the feast is concluded the body is buried in a hole, and covered up with leaves. The property of the deceased is retained by the widow until her death, when it is divided among the children, the greater portion falling to the share of the males. Should the deceased be unmarried his property is divided among his relatives.

August 20.—The Iris, which had been sent to Amboyna for provisions, returned, having also on board some guns for the fort. The commander reported that the French corvette l'Astrolabe had arrived at Amboyna from the South Seas, many of her people being sick.

On the 24th the fort was opened with much ceremony, and possession was taken, in the name of the King of the Netherlands, of the entire west coast, and part of the north and south coasts of the island, from the meridian of 141° E., on the south coast, to the Cape of Good Hope on the north. Many of the native chiefs were present, who swore allegiance to the Netherlands' government.

Sept. 1.—The vessels left the coast of New Guinea, and the corvette arrived at Amboyna on the 5th, when sixty-two men were sent ashore to the hospital, several of whom died; making the total loss of European seamen, by sickness during the voyage, amount to twenty-one. From Amboyna the corvette was despatched to the island of Timor, where the naturalists were left to make researches in the interior for silver and copper mines.*

During their stay on the coast of New Guinea much rain was experienced, and for nearly the entire month of July the weather was cold, damp, and foggy. This led them to conclude that, as in the Moluccas, the south-east monsoon is the rainy season, and the north-west monsoon, which prevails from October to May, is the fine season. This opinion was confirmed by the statements of the natives.

Three small low islands, belonging to the chain which stretches from Cerama to the Key islands, and not laid down in Arrowsmith's chart, were met with in the passage from New Guinea to Amboyna. The northernmost of these islands is situated six miles to the southward of the Matabella Islands; and there is a clear channel between them, through which the corvette passed. They may easily be distinguished from the Matabella Islands, as the latter are high, and the southernmost has a small table hill on the south point. The positions of these islands are given below.

Positions ascertained during the voyage of the Triton.

[The meridian distances were measured from Banda, and corrected on their return there.]

	Lat. S.		Long. E. of Greenwich.
Bird Island (S. of Banda) .	5° 29′	—	131° 1′ 21″
N.E. Point of the Great Key .	5 22	—	133 33 00
N.W. Point of the Island Wassier (one of the Arrus)	5 26	—	134 21 00

* When Dr. Wilson was at Coepang in 1829 the resident and the naturalists were absent in the interior, searching for the mines. They discovered some gold dust in the streams. but whether they succeeded in the main object of their search is not known.—ED.

S.W. Coast of New Guinea—

	Latitude.			Longitude.		
N. Entrance of Dourga Strait—						
North Point	7°	21′	—	138°	55′	30″
South Point	7	28	—	138	45	—
A Bank of hard Sand (centre)	6	00	—	138	4	3
Providential Bank	5	38	30	137	55	41
False Utanata River	4	49	—	136	56	—
A small Island near the Coast	5	12	—	137	41	—
A remarkable Point	4	43	—	136	24	—
Utanata River	4	33	—	136	11	—
Point Boero	4	7	—	135	9	—
Island Lakahia	4	2	—	134	53	—
—— Namatotte (centre)	3	44	—	134	1	45
Fort du Bus (in Triton's Bay)	3	41	—	134	15	—
S. Point of Pulo Adie	4	19	—	133	57	—
Three Islands to the southward of the Matabella Islands, are respectively—	4	32	—	132	4	52
	4	34	—	132	1	10
	4	33	—	132	0	—

The following Vocabulary of the language of the people of Utanata and of Lobo, the district in which the settlement was made, was collected during the voyage. The people of the south-west coast have a strong guttural pronunciation, apparently similar to the *cluck* of the Caffres of South Africa:—

	Utanata.	Lobo.
Arise (To)	Eté pokari	—
Armlet	Tutura	—
Arrow	Tiäré	Larakai
Arms	Too	Nimaugo
Back	Urimi	Rusukongo
Bamboos	Buïti	Karawatu
Basin	Pigani	Bingau
Bear (To)	Kattarie	Missingi
Black	Ikoko	Maitan
Bird	—	Manok
Buy (To)	Payrie	Tamanguri
Bow	Amuré	Kewo
Bird of Paradise	—	Sianga
Beard	—	Minoora
Belly	Imauw	Kanborongo
Breast of a woman	Auw	Gingongo
Ditto of a man	Paiëty	
Copper	Tapaka	Sinduwa
Cocoanut	Uteri	Nieuw
Crab	Peä	Karabba
Cough (To)	Otay	Wouru
Cucumbers	Katumini	—
Crown pigeon	—	Titin
Cocatoo	—	Waria
Clear	—	Nabuna
Cut (To)	—	Nateter
Cheap	—	Feri tei
Child	Mutuki	Tamanetto
Cheeks	Awamu	Wafiwiriöngo
Darkness	Marok mameo pokana	Momat
Death	Namata	Namata
Drink (To)	Nemuka	Makinu
Dance (To)	Die	Tasula
Dog	Wuri	—
Dear	—	Feri
Ears	Iänie	—
Eyebrows	—	Matatongo-wuru
Earth	Tiri	Eua
Evening	Jauw Aroă	Urwawa
Eat (To)	Nemuka	Kuka
Eyes	Mamé	Matatongo
Fire	Oeta	Lawie
Feathers of a bird	Wiegu	Manok wo eru
Fruit	—	Kai-wai-wo
Fish	Eriki	Donde
Fingers	—	Nimango-sori
Foot	Mouw	Kaingo
Great	Napitteki	Nabitteki
Go (To)	Jaga	Utangie
Grass	Motere	—
Good	Temoni	—
Give (To)	—	Mangia
Hands	Toe Mare	Nimango Uta
Hair	Oeirie	Mouong-furu
Hill	Pamogo	Foekar
House	Kamy	Sarin

	Utanata.	Lobo.
Hog	Oe	Booi
Handsome	Nata	Nangewie
Howl (To)	Maké	Tatangies
Here	Aré	Inairi
Help (To)	—	Bakun
Human being	—	Teima
Head	Oepauw	Monongo, or Umun
Iron	Puruti	Warusesy or mumumur
Island	—	Nusu
I	Areä	Laku
Knee	Iiipu	Kaingo woko
Knife	Pagati	Toeri
— chopping, or parang	Tai	Binda
Kill (To)	—	Mawuni
Leg	Imiri	Kaingo
Lemons	Munda	Munda
Linen	Pigi	Tais
Little	Mimiti	Netu
Long	Marawas	Marawas
Laugh (To)	Oku	Marifie
Lay (To)	Aïkai	Koekeimanse
Lazy	—	Uto kongo-nusa
Morning	Kameti	Sinenére
Moon	—	Furan
Marry (To)	—	Nawesa
Man	Marowana	Marowana
Mouth	Irie	Oriëngo
Nutmegs	Uteké	Balla
Noon	Kameti aroä	Oertoto
No	Pokana	Maratei
Night	Tappo	—
Nose	Birimboe	Sikaiongo
Neck	Ema	Garang
Oyster	Oma poä	—
Plantains	Kauw	Fudi
Plate	Pigani	Piring
Prahu, or canoe	Kol	Bieri
Put (To)	Tomo	Bakarewus
Pumpkins	Ampuni	—
Paddle, or oar	Poo	—
Pearls	—	Waysetu
Red pepper, (Chili)	Maresen	—
Rain	Komak	Komak
River	Warari na-peteki	Walar nabetik

	Utanata.	Lobo.
Rope	Warauw	Waras
Red	Napetiäro	Wambar
Run (To)	Ikomorie	Tafararu
Rice	Wata	—
Rattan	Kama	—
Run away (To)	Mau-mau-mau	—
Sugar-cane	Mone	Tamu
Sago	Kinani	Kakana
Sun	Jauw	Orak
Slave	Manoki	Mooi
Short	Mimiti	Tomba
Sick	Matigati	Nawitik
Shoot (To)	Iege	Bakareru
Sit (To)	Aipa	Tamatoren
Speak (To)	Iwari	Iwar
Stand (To)	Ikonogo	Tamariri
Sing (To)	Iwani	Tawaö lala
Sleep (To)	Eté	Kokenaf
Sail (To)	Kapoty	Sirurut
So	Ooh	Nangowamu
Sago tree	Amati	—
Stone	—	Langera
Stars	—	Komakoma
Sell (To)	—	Kusembera, or Té
Sting (To)	—	Narowa
Tongue	Maré	Kariöngo
Thigh	Ai	Willanima
Tree	Pah	Kajuakar
Tobacco	Kapaki	Tambako
Take away (To)	Namatorani	Motara
There	Aroä Pokana	Douanga
Turtle	Piäko	—
Trepang	—	Keembi
Take up (To)	Awarie	—
Turtle-shell	—	Keram
Thou	—	Kauw
Teeth	Titi	Riwotongo
Toes	—	Nisora
Village	—	Mundu
Woman	Kurani	Mawina
Wood	Kai	Kai
Water	Warari	Malar, or massieno
Wind	Lowry	Lowr
White	Topoka	Rakaraka
Whistle (To)	Waró	Fangus
Yes	Aroä	Oro
Yellow	—	Kuning
Zealous	—	Marani

A bad person	Timoni tomaka pokana	Teman su-manga
To be afraid	Napopari	Kumetato
Not to be afraid	Napopari pokana	Kumetato tei
What is that	Aroä aga	Inay lowena
Almost	Arook	—
Is bought	Pay roea	—
Not so	Aroä pokari	—
Far away	O! O! O! akami	—
To have gotten	Iwar roea	—

I do not know it	Naro nata-moera	—
Cannot buy	Payrua po-kana	—
To-day	—	Momatinai
Not yet	—	Wakasai
Too dear	—	Feri nabeteki
Is sold	—	Kusembera bunaroka
Is not yet sold	—	Kusembera tei nakeno
Will not sell	—	Kusembera tei

The people of Utanata had very little knowledge of counting. When wishing to make known any number, they made use of the word Aweri, and counted on their fingers and toes. The following are the numerals of Lobo and Onin:—

	Onin.	Lobo.		Onin.	Lobo.
One	Sa	Samosi	Twelve	Pusuä resi nuwa	Wutsja resin ruéti
Two	Nuwa	Ruéti			
Three	Teni	Touwru	Twenty	Puty nuwa	Sekumat ruéti
Four	Faat	Faat			
Five	Nima	Rimi	Twenty-one	Puty nuwa resi sa	Sekumat ruéti resin samosi
Six	Nom	Rimi samosi			
Seven	Tarassa	Rimi roeéti			
Eight	Taranoewa	Rimi touwru	Thirty	Puty teni	Sekumat touwru
Nine	Saputy	Rimi faat			
Ten	Pusuä	Wutsja	Hundred	Radja	Radsja
Eleven	Pusuä resi sa	Wutsja resin kasamosi	Thousand	Repisa	Reb

An account of the various plants collected during this voyage by the late M. Zippelius, the botanist to the expedition, will be found in a Dutch periodical, the *Konst-en Letterbode* for 1829, vol. i. p. 294, *et seq.*

V.—*Reise nach dem Ural, dem Altai und dem Kaspischen Meere.* Von Gustav Rose. Vol. I. Berlin, 1837.
Journey to the Ural and Altai Mountains, and to the Caspian Sea. Communicated by W. Wittich, Esq.

About twelve years since Baron Alexander von Humboldt resolved to visit the Uralian Mountains, because he conceived that there existed a similarity in the geological constitution of that range with the Andes of New Granada, and he wished to decide the point. Immediately on the court of St. Petersburg becoming acquainted with that resolution, it proposed to him to make the journey at the expense of the government of the country, authorising him at the same time to choose as companions some persons to assist him in his researches. He selected Professor Ehrenberg and Professor G. Rose, the author of the volume before us. Leaving Berlin in the spring of 1829, they went to St. Petersburg and thence through Moscow and Nowgorod to Kasan, whence they passed through Perm and over the Ural Mountains to Yekaterinburg, from which place they travelled along the eastern declivity of the Ural range as far northward as Bogoslowsk, in 60°N. lat., examining the geological constitution of the mountains and several of the numerous mines, which are met with on that side of the Ural. Having returned to Yekaterinburg they advanced to Tobolsk, and thence through the steppe of Barabinska to Bernaul, for the purpose of examining the Altai Mountains. Having traversed the steppe of Platowsk, they arrived at the Schlangenberg, and advanced afterwards to the other mines situated on the western declivity of the range. Whilst they were examining the mountains about Syränowsk, the

most southern of these mines, they visited Baty or Khonimailakha, in lat. 49° 10′ N., long. 84° 20′ E., a military post of the Chinese on the river Irtysh. From the banks of the Irtysh they began to return, passing through the steppe of Ishim to the southern range of the Ural, and to Astrakhan and the Caspian Sea. In returning hence to St. Petersburg they visited the great salt lake of Elton. Up to the present year no account of this journey has been published, except a few observations inserted in Baron Humboldt's "*Fragmens Asiatiques.*"

Professor Rose's work partly supplies this deficiency. It gives principally an account of the geological constitution of the countries through which they passed, and of its minerals, but contains also some interesting geographical observations.

In passing from St. Petersburg to Moscow they tried to ascertain the elevations of the hills of *Waldai* by barometrical observations. They found that the northern part of the table land was 724 feet above the Baltic at St. Petersburg, and the *Popowa Gora,* the highest part of the hills, did not attain more than 846 feet. Professor Rose, however, thinks that these determinations are only to be considered as approximations, on account of the considerable oscillations of the barometer.

It would however seem that the high ground which forms the watershed in the interior of Russia, between the rivers running south and north, increases in advancing eastward; for they found that the country situated between the Wialka and Kama constituted a table land, which rises to 870 feet above the sea, so that at the watershed itself the elevation must considerably exceed 1000 feet.

They crossed the Ural by the same road as Mr. Erman.* The greatest height of the pass between Klenowskaia and Kirgisshanskaia does not exceed 1344 feet, which seems to be the average elevation of the range between 56° and 58° N. lat., though some rocky masses rise perhaps a thousand feet higher. This elevation is doubtless very moderate, when we consider that the base on which the range rests, at an average, is 900 feet above the sea. The Ural, which here consists of three parallel ranges, occupies a width of about twenty miles. Professor Rose observes, that in several places the range does not constitute the watershed between the rivers of Europe and Asia, but that some of them rise on the eastern declivity of the mountains, and after skirting it for some distance break through the range and mingle their waters with those of the tributaries to the Kama. This, he observes, is the case with the *Tshussowaja*, a river rising about fifty miles south of Yekaterinburg, which skirts the eastern decli-

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* See Journal of R. G. S., vol. vi., p. 389.

vity of the Ural nearly as far as the parallel of that town, where it passes through the range and afterwards continues to the northward for a much greater distance along its western declivity until near 58° N. lat., it turns to the west and falls into the Kama. This river is navigable in spring, and then used for the transport of the produce of the mines of the Ural.

The elevation of Yekaterinburg is calculated, according to a series of barometrical observations, to be 768 feet above the sea; according to Humboldt's observations it is 784 feet, and according to those of Mr. Erman 976 feet.

In advancing northward along the Uralian chain it was observed that the range continued to preserve its moderate elevation until they had arrived at *Kushwinsk*, about 58° 20′ N. lat., where it appears to present several summits, which attain between 2000 and 3000 feet. But the highest part of the range is situated north of 59° N. lat., where several high summits rise above it. The highest of these summits are from south to north—the *Magdalinskoi Kamen*, the *Pawdinskoi Kamen*, the *Konshekowskoi Kamen*, the *Kakwinskoi Kamen*, and the *D'eneshkin Kamen*. The last-mentioned summit lies north of 60° N. lat., and is the highest of all. According to information which the author received in 1835, these mountains have been trigonometrically measured by Fedoroff, the Russian astronomer, who accompanied Mr. Parrot to the Ararat; and he has ascertained that they rise between 8000 and 9000 feet above the sea level. If this information should prove accurate, this portion of the range attains double elevation of the highest summits of the Ural between the parallels of 54° and 55°, and those in the neighbourhood of Slatunst, where they do not exceed 4000 feet. The high mountains which we have noticed, however, are not situated in the principal range of the chain, except the Magdalinskoi Kamen; all the others are placed to the eastward of it and rise in separate peaks. Where these summits occur lateral ranges extend to the eastward and advance a considerable distance into the plain, so that the Ural here occupies a much greater breadth.

This highest part of the Uralian range is traversed by two roads. The most southern begins at *Werkoturie*, and passes through the mining district of *Nicolaye Tawdinskoi*, at the southern declivity of the Tawdinskoi Kamen; afterwards it crosses the principal chain in about 59° 15′, and leads to the village of Koria and to the town of *Solikamsk*. The northern road unites *Bogosslowsk* in Siberia with *Tsherdin* in Europe, passing through the most northern mining district of the Ural, through that of Petropawlowsk, and on the northern side of the Kakwinskoi Kamen, crossing the principal range in 60° N. lat.

The last-mentioned road, till the year 1830, formed the boun-

dary between the known and unknown portion of the Ural. Nearly nothing farther north was known; but in 1830 an expedition of discovery was sent, and succeeded in the course of three successive years in examining the range to a distance of about a degree and a half farther north. They discovered extensive beds containing gold sand, and in some parts copper ore in abundance. Here, as well as farther south, the lower declivity of the range is covered with pine and fir trees.

Digging in a marshy ground near Bogosslowsk (59° 40′ N. lat.) ice was found six feet under the surface in the beginning of July. As the same phenomenon occurs at York Factory, on Hudson's Bay (57° N. lat.), we may presume that the mean temperature of both places is similar. At Bogosslowsk grain is grown, but does not ripen every year.

In passing from Tobolsk to Bernaul, Professor Rose and his companion traversed the Steppe of Barbinska, which extends about 200 miles in breadth, between the Irtysh river and the Ob or Oby. Our traveller says, that its surface is by no means dry and arid, as is commonly thought, but on the contrary, rather suffers from an abundance of water, being chiefly covered with large and small lakes and extensive swamps, and also traversed by several small rivers, which partly fall into the Om, an eastern tributary of the Irtysh, and partly into the Irtysh and Ob. Some portions of it present a perfect level, like the sea in a calm; others are slightly undulating and covered with grass, some birch and poplar. Some lakes are salt, and occasionally the surface of the ground is covered with saline efflorescence. In this steppe a peculiar disease is prevalent, called the Siberian plague.

That portion of the Altai mountains, which was visited by our travellers, had previously been examined by von Ledebour, Meyer, and Bunge, who give a minute account of it in their travels. We consequently find here little new geographical information of importance. We learn only, that the highest portion of the Altai mountains extends east and west in the parallel of 50°, between the Bukhtarma, a branch of the Irtysh, and the Koksun, a tributary of the Ob, and that the most western of its high summits, the *Holbowukha,* loses its snow in May, but is again covered with it at the end of July; further east is a still higher summit, the *Skhtskhebenukha;* but the highest is the *Bielukha,* which lies in the meridian of the Chinese military post of Tshingistei on the Bukhtarma, and rises, according to Mr. Gebler, who visited it in 1833, to about 11,000 feet above the sea. From this high mass a range branches off to the east-south-east, through which the river *Argut* breaks. This tributary of the Katunia is a much larger river than it appears to be in our maps, rising within the boundary of the Chinese empire.

The interesting account of the traveller's visit to the Chinese military post of Baty, we cannot notice further, as it is foreign to our purpose, and we have only space for a few observations on the geographical location of the mineral riches of the Ural, which have lately risen into such importance.

The sand, containing small particles of gold, occurs along the eastern declivity of the Uralian range, in numerous places north of 56° N. lat., and extends, as we have already observed, beyond 60° N. lat. It occurs on the western declivity likewise, but only in a few places, and contains less gold. On the Siberian side of the range, the sand from which the gold is extracted contains about one and a half or two solotnik of gold in a pood, or from $\frac{1}{2280}$ to $\frac{1}{1920}$; that which contains less is at present not worked. But Mr. Rose says, that even sand containing only $\frac{1}{7680}$ of gold can still be washed with profit. The expenses in washing gold containing between $\frac{1}{2280}$ and $\frac{1}{1920}$ of gold, amount commonly to $\frac{2}{5}$ of its net produce. Sometimes sand is found, of which $\frac{1}{600}$ and even $\frac{1}{300}$ is gold. A small quantity of silver is always mixed with the gold; it amounts to between 2 and 11 parts in 100. Near the Altai mountains likewise, gold sand has been discovered in some places, and they have begun working it. The first establishment for working this sand in the Ural was made in 1814, at Beresowsk, near Yekaterinburg, and since that time they have been increasing in number and extent. Last year the produce of all the Russian mines gave 27,885 marcs of gold, of which more than two-thirds were derived from the washing of the sand.

Professor Rose enters into great detail in his account of the platina mines. They are situated on the western declivity of the Ural, about the parallel of 57° 40′ north. He reached them on passing the range from the east; the highest part of the road rose only 1216 feet above the sea. The number of the mines is six, and they lie at a short distance from one another. In the most northern, called *Sukhowissimokoi,* the discovery of the sand containing platina was made in 1825, and at the other places it was found soon afterwards. The proportion of platina is much larger than that of gold, as it amounts on an average to $\frac{1}{142}$ of the whole mass. Sometimes pieces are found weighing some ounces, and even half a pound and upwards. A small quantity of gold is united with the platina. In 1834 platina was discovered in layers of serpentine. The produce of platina in 1836 amounted to 8270 marcs.

Whilst Baron Humboldt and his companions were travelling in the Ural, the discovery of diamonds in this range was made. Observing, that in Brazil as well as in New Granada, diamonds occurred together with gold and platina in the same beds of sand, Baron Humboldt had conjectured, some time before he went to

the Ural, that probably these precious stones might be found in the gold sand of that range, and he and his companions directed their attention to that point. Though they did not succeed in finding diamonds, these stones were discovered at that time at Bissersk (about 58° 30′ N. lat.), by Count Polier, in the gold-sand of this washing establishment. Two years later Mr. Major, or as he is called in Siberia, Mr. Mesher, an English engineer, who has made several steam-engines for the mines of Siberia, and is himself in possession of an establishment for washing gold-sand, in the neighbourhood of Yekaterinburg, discovered also two diamonds on his estate. Only small stones have been found, as far as is known; and up to July, 1833, their number amounted only to 37.

Professor Rose's book contains a detailed account of the mines in the Altai mountains, which we omit, as the most important information it contains has been made known by other travellers. We shall only observe, that he gives also an interesting account of the manufacture of Koliwansk, where vases and other elegant pieces of furniture are made, in different kinds of porphyry, granite, and avanturine.

Accompanying the work is an improved map of part of Northern Asia, between the limits of 51° and 60° N. lat. and 47° and 69° E. long., on the scale of $\frac{1}{2000000}$, or 2¼ inches to a degree, and various geological sections.

VI.—*Travels in Arabia. 1, In the province of 'Omán; 2, The Peninsula of Sinai; 3, Along the shores of the Red Sea.* By Lieutenant Wellsted, Indian Navy, F.R.S. 2 vols. 8vo. London. 1837. Murray.

During the last twenty years, the government of India have slowly but steadily been carrying forward a series of maritime surveys that do honour to the munificent spirit of the East India Company, who directed them, and to the zeal and perseverance of the officers of the Indian navy who have been selected to carry them into execution. We are far from implying that it is only during this period that the hydrography of those shores has been alluded to; on the contrary, the earliest records of the India-House bear abundant testimony to the constant and lively interest taken by the Directors in the improvement of the charts and navigation of the Indian Seas: but it is especially during the last twenty years that the surveys of the Persian Gulf, the shores of the Red Sea, the examination of Socotra and of the southern coast of Arabia, have been carried into execution, and have, in

some measure, given rise to the volume before us. Lieutenant Wellsted, of the Indian navy, well known to all the readers of this journal * as one of the greatest contributors to its pages, has been for upwards of ten years attached to the survey now carrying on of the shores of Arabia, and in which he himself has taken an active part; yet, not content with the daily routine of the survey, he has invariably profited by every opportunity of endeavouring to penetrate into the interior—of gleaning information respecting the natural history and statistics of the country, of the manners and customs of the various Arab tribes that people its coast, and occasionally has been very successful in exploring remains possessing much antiquarian interest.

Burckhardt, Niebuhr, and Bruce have made us acquainted with the western parts of Arabia, as the Hejaz and Yemen; but of the provinces of Hadramaut, on the south, 'Omán on the east, and the north-eastern portion washed by the Persian Gulf, we had but very imperfect knowledge.

The government of Bombay, desirous of obtaining some insight into the real extent of the power possessed by the Imám of Maskat, selected Mr. Wellsted as an officer qualified for so delicate a mission; and being liberally provided with letters of introduction, instruments, presents, &c., he arrived at Maskat on the 21st November, 1835, where he was very kindly received by the Imám, and furnished with every thing he could desire for his journey. Mr. Wellsted draws a very favourable portrait, and we believe deservedly so, of the sovereign of 'Omán.

Quitting Maskat, our traveller went to Súr, thence to the encampment of Beni Abú Alí, and to the distance of 120 miles in a south-west direction towards the sandy desert. Continuing his journey to the north-west, along a series of oases, in the parallel of 23° N., he ascended the heights of *Jebel Akhdar*, rising 6000 feet, and commanding a view of the Arabian Sea. Mr. Wellsted gives an interesting account of the tribes inhabiting this range, and his description of the descent in a southerly direction upon Nizzuwah is striking:—

"Before us there rose from the centre of the valley a hill of a pyramidal form, on whose summit stood a ruined tower of large dimensions and massive architecture, which is said, in latter years, to have served the purpose of a mosque; but tradition asserts that it was also frequented as a place of worship by their Pagan ancestors. Following the direction

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* Mr. Wellsted has so liberally contributed to the journal of the Geographical Society, that we cannot deny ourselves the gratification of giving a brief sketch of the whole of his travels, but which, being in English, we otherwise should not have noticed, our desire being rather to give analyses of *foreign* geographical works not generally accessible to the English reader; and *ceteris paribus* selecting those published in Russia, Holland, Germany, and Spain, in preference to those published in the French language, which is familiar to nearly all our readers.—ED.

of the western brow of the valley, we arrived at the summit of a pass, and thence obtained full view of the wild and savage glen beneath. Vines and terraced grounds extended for three or four miles from Shirázi, and below patches of cultivated ground occur at intervals throughout its whole extent.

"The lively green of these, joined to the glistening of some pools of water, formed a striking contrast with the sombre and shadowy line of the magnificent wall of rock which rose precipitously on either hand. It took us four hours to reach the bottom of the pass, whence the descent still continued to Birket el Moge, in no part exceeding a hundred paces in breadth; and the overhanging mountains rise almost perpendicularly to the height of from 2000 to 3000 feet, affording an excellent opportunity of investigating the geological structure of the range, which consists of,—1st, Alpine limestone, 2nd, old red sandstone, with an occasional micaceous vein: 3rd, alternately mica slate and granite. Large masses have been splintered from the sides of these rocks, blocking up the bed of the valley; a stream of water traverses the centre; small hamlets, date groves, and patches of cultivated ground, occur occasionally till we reached, after five hours, the village of Birket el Moge, situated at the gorge of the pass, where it opens out into the plain."—p. 152.

Continuing his journey to the northward, Mr. Wellsted reached Obrí on the 12th March, where he found, much to his regret, that any farther progress towards Der'ayyah, the capital of the Wahhábís, and the original object of his journey, was impossible, on account of the hostile state of the Arab tribes: he was therefore obliged to retrace his steps to Maskat.

A detailed account of the manners, customs, and the different sects of Mohammedanism, with an account of a visit to the highly interesting ruins of Nakabul Hajar, about seventy miles from the southern coast, and a copy of some undeciphered inscriptions, believed to be in the Himarytic character,* closes the first volume.

The second book contains a full account of the Peninsula of Mount Sinai, the shores of which, for the first time during this survey, have been correctly laid down on our maps. In his various journeys into the interior, Mr. Wellsted examined that remarkable phenomenon in the vicinity of Tor, called the *Jebel Narkús,* or Mountain of the Bell; the subject of the passage of the Red Sea by the Israelites is also touched upon, and the wild and singular Gulf of Akaba is described.

Mr. Wellsted has also had the good fortune to furnish a complete vindication of the truth of Bruce's observations along the

* Through the kindness of Dr. Brabant and Mr. Yates, we have been enabled to forward copies of these inscriptions to Professor Gesenius, at Halle, and to Professor Von Bohlen, at Königsberg, which if taken advantage of, will afford them occasions for distinguishing themselves, and of contributing largely to our stock of genera and geographical knowledge.

western coast of Arabia, and with that highly commendable feeling that should animate every traveller—to prove the truth of, and honestly to state, the observations of his predecessors in the same path—he has placed this subject in a prominent point of view, and triumphantly vindicated the memory of that courageous traveller Bruce.

These volumes are accompanied by an excellent map of the province of 'Omán, by Mr. John Arrowsmith, from routes and observations supplied by Mr. Wellsted. The narrative is written in an unpretending, straightforward, sailor-like style, and we trust its reception by the public may be an example to Mr. Wellsted's brother officers, whether of the Indian or Royal Navy, that the opportunities for observing, which are placed within their reach in the common course of naval service, if taken advantage of, will afford them occasions for distinguishing themselves, and of contributing largely to our stock of general and geographical knowledge.

VII.—*Ueber die Kawi-Sprache auf der Insel Java nebst einer Einleitung über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluss auf die geistige Entwickelung des Menschengeschlects.* Von Wilhelm von Humboldt. Erster Band. Berlin, 1836.

[*On the Kavi Language in the Island of Java, with an Introduction on the Varieties in the Structure of Human Languages, and their Influence on the Intellectual Development of the Human Race.* By William de Humboldt. First Vol.] Communicated by the Rev. G. C. Renouard.

OF the many authors distinguished by various and profound learning who flourished in the seventeenth century, few attracted more notice in his own times, and none left behind him more honourable memorials of ability and industry, than Job Ludolph, who, when verging on the third age of man, resumed and perfected the studies of his youth; and, at that advanced period of life, composed a series of works replete with stores, drawn from the most remote and varied sources; nor have his works been yet superseded by the vast accumulation of knowledge acquired in the century and a half which have elapsed since his decease. But that which raises our admiration of Ludolph to the highest pitch, is the fact that these works were not compiled in the closet of a recluse devoted to learned and abstruse speculations, but the productions of a man constantly engaged in public business, as the minister of his sovereign, either at home or abroad; one, in short, whose severer labours must all have been dedicated to the service of the State. There is perhaps no country in Europe where the ardour of a scholar and the application and sagacity of a politician

can be found so singularly combined, except Germany; and that country has in our own times produced not only a Niebuhr, whose literary pursuits were merely delayed, as Ludolph's were, by his political engagements, but still more the distinguished author of the work named above. William de Humboldt, though less known in this country than his illustrious brother, has long ranked among the most eminent scholars in Germany, who, notwithstanding the close attention demanded by his important duties as a Minister of State, found time to cultivate the science of language to an extent and depth rarely, if ever, equalled. His various papers in the Memoirs of the Royal Academy of Berlin, to say nothing of his earlier works, are marked with a compass of observation and a capacity for analysis which go far to place him as high in the scale of metaphysical, as his brother, Baron Alexander de Humboldt, stands in the ranks of physical inquirers.

Nor will the work to which the reader's attention is now directed fail to establish, on a still broader basis, the reputation of this amiable and eminent man. Though bearing the unassuming, we might almost add, repulsive title of an inquiry "into the Kavi Language extant in the Island of Java," it contains materials which develope an extent of knowledge, an acuteness of perception, and an accuracy of distinction, such as is rarely witnessed. The author's views, though often novel, are almost invariably derived from a clear train of logical deductions, and therefore rarely fail to carry conviction to the reader's mind. In the Introduction, which fills 430 pages, and may be considered as a separate Treatise, and will therefore be more generally interesting than the work itself, the author unfolds his theory of the nature and origin of language.

To attempt anything like a tolerable analysis of this theory would require a much larger portion of time than is now at our command; to say nothing of the difficulty of condensing what is scarcely susceptible of condensation, or of rendering intelligible, without much periphrasis, some of the most subtle speculations which metaphysical science can present. We must therefore content ourselves with giving such a notice of the contents of the different sections of M. de Humboldt's work as will afford some notion of its character and the light which it throws on one of the most complicated operations of the human mind.

After a few preliminary remarks on his mode of expressing Asiatic words in the Roman character, and a list of authors cited, M. de Humboldt proceeds to fix the sense in which he uses the phrase "Malayan Tribes" (p. 1—15) to give a plan of his work (p. 16), and to explain the object of the Introduction (p. 17). By the "Malayan Tribes" he means that widely extended race which occupies the shores, at least, of almost all the islands of the Eastern and Pacific Oceans from Madagascar westward to the

Society Isles eastward. To investigate the structure and peculiarities of the Malayan language, and the character of the people by whom it is spoken, and to inquire into the influence of foreign civilization on their language and habits, are the objects of his work. But before the subject of lingual and ethnological affinities can be satisfactorily investigated, we must endeavour, he observes, to form a clear notion of the process followed by the mind in the formation of language; to that therefore the remainder of his Introduction is devoted.

After having considered in the five following sections the progress of human development, the effect of extraordinary mental powers, civilization, and culture, and the additional influence of individuals and nations, he proceeds to inquire more immediately into the subject of language (sec. 7); the form of languages (sec. 8); the form and condition of languages generally (sec. 9); sound, and particularly articulate sounds; their changes; their connexion with ideas; their indication of general relations, the internal sense of articulation, and the system of sounds in language, and its technicalities (sec. 10). The 11th section treats of the internal form of language; and the 12th considers the combination of sound with this internal form. The subjects afterwards noticed are a more accurate exposition of the process of language with the affinities and forms of words (sec. 13); the isolation, inflexion, and agglutination of words (sec. 14); a closer examination of verbal unity; the system of incorporation in languages; marks of verbal unity; pauses; change of letters (sec. 15): accentuation (sec. 16); incorporation; division of a sentence into its members (sec. 17); agreement of sounds with the requisites (sec. 18); the principal distinction founded on purity of the principle of formation (sec. 19); character of languages, poetry, and prose (sec. 20); power of languages to develop themselves advantageously from each other. On the synthetic faculty in language; the verb, conjunction, pronoun relative, examinations of the development of inflected languages; languages derived from the Latin (sec. 21). Retrospect on the preceding part of the inquiry; on languages which deviate from the purely legitimate form (sec. 22). Condition and origin of the less perfect structure in languages; Semitic languages; the Delaware language (sec. 23). The Chinese language; condition and origin of the less perfect structure; the Burman (sec. 24). Did the polysyllabic structure arise from the monosyllabic? (sec. 25).

This enumeration, meagre as it is, will be abundantly sufficient to show the compass and interest of the dissertation itself; and greatly would our countrymen be indebted to the scholar who should favour them with such a version of the work as it deserves: but as in speculation so closely connected with the most subtle operations of the mind, language is inadequate to express what a

deeply exercised understanding can conceive, it is no wonder if the full sense of M. de Humboldt's words cannot be always easily attained. His style is remarkable for terseness and perspicuity, but the obscurity inherent in his subject is sometimes sufficient to baffle even his endeavours to render tangible a thread which so few have the power of seizing; a translation therefore of this able work would be a most arduous, though a most meritorious undertaking.

The remainder of the volume contains only the first book of the projected work, the sequel of which will appear in successive volumes, prepared under the eye of Baron Alexander de Humboldt, who speaks in the preface of his brother's worth and labours in terms which reflect the brightest lustre on the mind from which they sprung.

The present and the following book (p. 16) will treat of the Kavi language, considered as that dialect of the Malayan in which the influence of the Sanskrit is most manifest. But the original element of the Malayan tongue will be constantly distinguished from all extraneous adjuncts, and will be traced to its development, in its greatest purity, in the Tagala, or language of the Philippine Islands. The third book will comprehend a view of all the Austro-Insular languages, and terminate by an endeavour to ascertain how far we can determine their derivation from one common stock, and their mutual relation to each other.

It is not from any vain hope of satisfying the reader's curiosity by such an enumeration of the contents of M. de Humboldt's work as this, that it has been inserted in the Geographical Journal, but principally to call the attention of our countrymen to a production so deserving of study, and most particularly to express the grateful sense of what is due to Baron Alexander de Humboldt on the part of the Geographical Society, which is indebted to his munificence for the copy of his brother's work from which these extracts were taken.

VIII.—*Supplémens au Recueil de Mémoires Hydrographiques pour servir d'analyse et d'explication à l'Atlas de l'Océan Pacifique.* Par le Vice-Amiral de Krusenstern. St. Pétersbourg, 1836.

IT has been well observed, that "the man who points out, in the midst of the wide ocean, a single rock unknown before, is a benefactor of the human race;" and scarcely less so is he who, after careful examination, is able to decide that an island, or rock, or shoal, which appears on a chart, is either misplaced or has no existence. This title then, in its most extended signification, must by all navigators of the Pacific Ocean be most gratefully accorded to Vice-Admiral Krusenstern.

Thirteen years have now elapsed since the publication of the first part of his *Mémoires Hydrographiques;* in 1827 the second part appeared, comprising the northern half of the Pacific Ocean; and now we have before us a third volume, being a supplement to the two former, correcting all the errors that appeared in them, and registering all the discoveries and newly-determined positions that have been made in the lapse of the last thirteen years, during which more has been done towards obtaining a correct knowledge of those seas than at any time since the voyages of Cook and La Perouse.

Nor do his labours terminate here; ever at his post, and, like our own lamented Horsburgh, always on the watch for the most recent information, Admiral Krusenstern seizes on every report of newly-discovered islands, carefully sifts the evidence on which the report rests, and, by the aid of judicious criticism, extracts truth from the too often conflicting statements, and at once proclaims it to the public by communicating it to the Academy of Sciences at St. Petersburg, who print it in their monthly bulletin, which circulates throughout the civilized world. That learned body has lately shown how highly it values the practical services rendered to his country and to Europe, by conferring on Admiral Krusenstern its highest honorary reward.

We must now turn to our country, and however humiliating may be the fact we are bound to state it, that discovery after discovery may be made, and in fact they are annually made by our numerous shipping employed in the Pacific Ocean, and no register of them is kept—no competent person examines them to sift out the truth or falsehood: our map-makers may, if they please, insert them in their charts—and thus, as is clearly shown by Admiral Krusenstern, do our best charts of the Pacific Ocean—charts to whose guidance property to the amount of nearly ten millions sterling is intrusted*—contain hundreds of errors. Surely this ought not to be.

It is not the province of the Geographical Society to find fault, or severely to criticise any work that may come before it: we believe it is admitted that where praise cannot be given, it is better to say nothing; but there are cases in which such silence would be a wilful dereliction of duty. We owe a duty to the public which is paramount to any individual consideration, and where the lives of our seamen and property to so large an amount are annually risked, however painful it may be, it would be highly culpable not to state the truth—we have therefore transferred to our pages a list of the errors, published by Admiral Krusenstern two years ago, contained in one of our most widely circulated charts, and not one of which has since been corrected:—

* We have our information from the largest ship-owner and the most spirited proprietor of vessels trading to the South Seas.

	Lat.	Long.	Authority.	Corrections to make in Arrowsmith's Chart. Lat.	Long.
Phœnix Island	3·42 S.	170·43W.	Tromelin.	0·12 S.	
Matthew's Rock	22·3	171·12E.	D'Urville, 1827.		1·20 W
Stephens' Island, or Providence	0·20	135·10E.	Ditto.		2·30 W
Macquarie Islands (centre)	54·39	158·41E.	Bellingshausen		1·0E.
Curtis Island	30 36	178·44W.	D'Entrecast., 1793.	0·27S.	0·28E.
Macaulay Island	30·16	178·32W.	D'Entrecast., 1793.	0·27S.	0·28E.
Prince William Henry	18·44	141·41W.	Beechey.	0·26	0·36
Cape Deliverance (Louisiade)	11·23	154·16E.	D'Urville.	0·23	
Tiger Island	1·44	142·20E.	Bristow, 1817.	wanting.	
Pocklington Shoal (Jones)	10·53	155·30E.	Horsburgh.	wanting.	
Bayonnaise Bank	12·8½	179·44W.	Fromelin.	wanting.	
Beveridge Reef	20·0	167·12W.	N. Mag. Aug. 1833.	wanting.	
Osborn Reef	27·0	146·17W.	Nielson, 1827.	wanting.	
Lyra Shoal	1·54	153·28E.	Renneck, 1826.	wanting.	
Fead Islands	3·30	154·30E.	Horsburgh.	wanting.	
Alert Reef	9·52	140·50E.	Ditto.	wanting.	
Welsh Bank	21·15	153·56E.	King.	wanting.	
Mid-day Reef	21·58	154·20E.		wanting.	
Saumarez Reef	21·40	153·46E.		wanting.	
Tregosse Islands	17·44	150·32E.	Tregosse, 1821.	wanting.	
Alert Rock or Shoal	17·2	151·49E.		wanting.	
Farquhar Group (Eastern Island)	17·39	151·27E.		wanting.	
Wells Shoal	12·20	158·13E.	Edwards & Flinders	wanting.	
Shelburne Shoal	3·15	148·16E.	Horsburgh.	wanting.	
Circular Reef	3·18	147·40E.	Ditto.	wanting.	
Bell Rock (Bass Strait)	40·27	144·12E.	Ditto.	wanting.	
Sidmouth Rock	43·48	147.11E.	Ditto.	wanting.	
Carteret Shoal	2·55N.	131·38E.	Carteret.		3·0
Jap Island (North Pt.)	10·0	138·8E.		0·30S.	0·42 W
Arrecife Island	9·31	161·8E.	Horsburgh.	0·30S.	1·0E.
Mackenzie Islands	10·5	139·40E.	Krusanstern.	wanting.	
Rosario Island	27·16	141·4E.	Lütké.	wanting.	
St. Paul	57·10	170·18W.	Beechey.	wanting.	
St. George	56·37	169·33W.	Ditto.	wanting.	
Canton Packet Shoal	0·35	128·55E.	Horsburgh.	wanting.	
Layson Island	25·46	171·49W.	Stanioukovitch.	wanting.	
Tromelin Island	9·52	140·42E.	Tromelin.	wanting.	

The islands of Bauman, Tienhoven, and Roggeveen do not exist.
Stephens' Island is the same as Providence Island.
All the north-eastern coast of New Guinea is wrong.
Cook's Strait and all the southern Island of New Zealand is wrong.
In the Society Islands numerous errors exist.
Fugitiva Island, Manua Island, Lostange Island do not exist.
The *Navigator* or *Samoa* Islands want correction throughout, according to Kotzebue.
The *Fidji* Islands all incorrect, according to D'Urville.
In the low Archipelago all Captain Beechey's discoveries and corrections are wanting.
The Aleutian Isles and the coasts of Kamtchatka extremely incorrect throughout.
In the Caroline and Marianne Islands, all the recent observations of Freycinet, Duperrey, and Lütké are wanting.

These are some of the most important errors in Arrowsmith's nine-sheet chart of the Pacific, professing to be corrected up to the year 1832. This is much to be regretted; the more so, as at the time it was published by the late Mr. Arrowsmith, it was the best chart in Europe, and its former credit still causes it to circulate widely.* A list of these errors has been sent to Mr. Arrowsmith, and it is to be hoped they will be corrected.

Admiral Krusenstern says that Norie's chart of the Pacific, in six sheets, is very superior to the former, but that several serious errors exist even in it; for instance, the corrections of Duperrey and Lütké are not inserted: our own examination of this chart, as far as leisure has permitted, would lead to the same opinion, but we have every reason to believe that Mr. Norie is willing and anxious to correct every error that is pointed out; and we have

* We are informed that forty copies of it are annually sent to the United States of America, besides those sold in England.

no doubt that a list of corrections that we have been enabled to send to him will be inserted shortly in a new edition. The Geographical Society is indebted to Mr. Norie for some recent information respecting a new group in the Pacific, which will be found at p. 453, discovered in the spring of this year by Her Majesty's ship Actæon.

We believe we do but express the wish of all who are interested in the welfare of seamen, and in the advancement of Hydrography, in hoping that Admiral Krusenstern will continue to watch over all future discoveries with the same attention he has lately bestowed on those in the Pacific Ocean.

IX.—*Description Nautique des Côtes de l'Algérie.* Par Capitaine A. Bérard; suivie de Notes, par M. De Tessan, Ingénieur Hydrographe. Paris, 1837.

THE detail of the operations of the various coast-surveys which have been executed by this country within the last five-and-twenty years, including, besides our own coasts, great part of the shores of the Mediterranean—the east and west coasts of Africa—the West Indies—and the shores of Patagonia, Chile, and Peru—has, after being examined by the hydrographer, usually been consigned to the "Record Office," those parts only being published which are requisite for our shipping,—as the chart and brief practical sailing directions. Thus far the immediate object for which the surveys were instituted is accomplished; but is it not much to be regretted that a large stock of valuable geographical information should thus be almost consigned to oblivion?

The work before us is a happy innovation upon such a bad custom, and the great demand for it by the public, and the high praise it deservedly meets with wherever it is known, is a complete answer to the question we have heard asked, "Who would read such a work?" Surely in a country so essentially maritime as Great Britain, an accurate nautical description of a coast will not only find readers, but will be highly appreciated by all who take an interest in geography. We are far from meaning to imply that such a description should take the place of sailing directions—never for one moment—*they* should be brief, plain, and practical, such as a sailor, in the hour of need, may turn to with confidence; but as an appendix to these directions, we would gladly see such a description of a coast published, as may enable those, who are competent, to form some judgment of the accuracy of the survey represented on the chart, and such as geographers in the present day have a right to expect.

The northern shore of Africa, from Al Araish, on the confines of Egypt on the east, to the gulf of Bugía on the west, was sur-

veyed in detail under the direction of the British Government in 1820—4, by Captain W. H. Smyth, R.N.; again, from Bugía on the east, to Cape Spartel, was examined by Tofiño in 1783—6, and many of the positions of the excellent old Spanish hydrographer, as inserted in his *Derrotero*, are confirmed by recent observation. This latter survey being found inadequate to the wants of a rapidly growing intercourse between France and *l'Algérie*, the French government directed a more minute examination of parts of the northern shore of Africa, of which the work before us is the result.

The present survey of this coast extends from Cape Serrat in 9° 12′ E. to the Ja'farín Islands in 2° 26′ W., a distance of about 700 miles; and the work before us is a detailed account by M. Bérard, accompanied by some excellent notes by M. de Tessan, of the *contour* and appearance of the coast; of the heights of mountains; and of the mode of conducting the survey, which leads us to place the fullest confidence in the accuracy of the results obtained. Such a work, from its nature, is not susceptible of analysis, but we subjoin a few of the principal positions determined:—

	Lat. N.	Long.
Algiers	36° 47′ 20″	3° 4′ 25″ E.
Areshkúl	35 19 37	1 29 0 W.
Abuja Pt.	35 53 25	0 28 0 W.
Bona	36 53 58	7 45 56 E.
Bugía	36 46 34	5 4 51 E.
I Fratelli	37 18 6	9 24 19 E.
Galita Id.	37 31 14	8 56 18 E.
Falcon Cape	35 46 25	0 47 11 W.
Fegalo Cape	35 34 18	1 11 25 W.
Hone Cape	35 8 20	1 49 45 W.
Jezaïr-ul-Ja'farín	35 11 0	2 26 0 W.
Jezaïr-ul-Habíb	35 43 28	1 7 38 W.
Mars-al-Kebír	35 44 21	0 41 10 W.
Milonia Cape	35 6 10	2 10 45 W.
Noch Mount	35 8 0	1 41 0 W.
Serrat Cape	37 14 0	9 12 23 E.
Tabarcah	36 57 59	8 45 28 E.

The charts accompanying this work are admirably engraved; they consist of a general chart in two sheets, on the scale of five inches to a degree—of five special charts, and six plans of islands and anchorages; and both they and the work are illustrated by beautifully etched views of the whole coast, taken always on a south bearing, and drawn according to a fixed scale. Both the charts and the description do honour to MM. Beautemps-Beaupré and Daussy, who directed the survey; and to MM. Bérard and de Tessan, who have successfully carried it into execution.

MISCELLANEOUS.

I.—*A General Statement of the Labours and Proceedings of the Expedition to the Euphrates, under the Command of* COLONEL CHESNEY, Royal Artillery, F.R.S. Communicated by Colonel Chesney, R.A., F.R.S., &c., and W. Ainsworth, F.R.G.S., and For. Corr. Geog. Soc. of Paris.

[WE have the high gratification of being enabled to communicate the first and only complete account of the Euphrates Expedition which has yet been given to the public. The annexed brief history of this remarkable undertaking extends from its commencement to its final breaking up; and further records the different objects which were accomplished even after that period, till the return home of the various parties.

The enterprise itself was, in many points of view, one of the most interesting that has ever left the British shores. Its objects were the establishment of steam communication with India; its route lay through almost unexplored countries, than which there are few possessing more geographical or historical interest; the expedition was directed by scientific officers well supplied with instruments; and ultimate success was confidently expected.

Nor has this expectation been disappointed; everything which could reasonably have been looked for, has been accomplished; the spirit of active inquiry and labour which appears to have actuated the commander and all who were under him, combined with the uniform harmony and good feeling which prevailed under circumstances of no common trial, ought to be a source of national congratulation. Materials for a correct map of a very large portion of Northern Syria were collected; a line of levels was carried across from the Mediterranean to the Euphrates: Northern Mesopotamia was explored, and the grand survey of the river commenced with the descent of the steamers, and continued to its embouchure in the Persian Gulf. At a subsequent period two different ascents were made of the Kárún and two descents of the Bahamishír, while the country intervening between the Jeráhí and the Euphrates, the great Delta of Susiana, concerning which so much that is incorrect is perpetuated in our most modern maps, was examined. Twice was the river Tigris ascended to upwards of 400 miles beyond its junction with the Euphrates; a second line of levels carried between the Euphrates and the Tigris; new positions obtained by the journeys across the desert;

and a geological section of the Taurus, of several hundred miles in extent, were among the last of the successful labours of the expedition.

A new country has thus been opened to navigation, to commerce, and to civilization, and the practicability of the introduction of steam navigation by boats properly constructed, has been placed beyond a doubt. Whatever may be made of this fact it is not our province to inquire; but it is highly gratifying to find that so much has been done towards forwarding the great objects of geographical and general science; and we have much reason to rejoice when the funds of the country and its men of enterprise are engaged in labours in which we may justly take the most patriotic pride; and the Geographical Society cannot but feel a debt of gratitude to those zealous officers and scientific men by whose energy and perseverance this remarkable undertaking has thus been accomplished.—ED.]

THE object of the present communication is not to anticipate the interest which must naturally be felt by the members of the Geographical Society, as well as other public bodies, not only in the progress of the expedition to the Euphrates, but also in the results obtained to science and general knowledge; for, to render these of any real value, they must be accompanied by the details of the means by which they were acquired. It is rather, therefore, with a view to the exhibition of how those means have been applied, and how the capabilities of the expedition have been directed, that the present statement is made; not, however, omitting those details which a brief notice of this kind will admit, when touching upon the labours and the progress of the enterprise itself.

The voyage to Malta from Liverpool occupied a period of twenty-nine days, a great part of which time was taken up in working out the details and consolidating the original plans of the commander. Among the scientific labours, independently of questions of general navigation, and drilling the men, were the rating of chronometers, observations in meteorology, on the temperature of the sea, and researches in natural history.

At Malta some time was devoted to the determination of the intensity of magnetic forces, and the amount of the dip of the needle. The cylinders used for the former experiments consisted of two pair which had been tried by Captain Sabine at Limerick, and another obtained through the kindness of Professor Lloyd, F.T.C.D., and tried at Dublin previous to departure; the whole set being subsequently experimented upon in London by Lieutenant Murphy, R.E., and also at Liverpool.

An exploratory tour was also made in the interior of the islands

of Malta and Gozo, with a view of recognising, in a general way, their geological structure and natural productions. Some fossil shells of interest were obtained, also the plants of the season (March), and some species of animals belonging to the classes tunicata, acalypha (malacodermæ) and polypi.

During the stay at Malta, Colonel Chesney was much occupied with the general objects of the expedition, more particularly about the construction of flat boats. The George Canning had been separated from the Alban steamer, her consort, by rude weather off Cork, and it was found impossible to remedy this loss at the Mediterranean station; but the admiral, Sir Josias Rowley, allowed the Columbine sloop to accompany the expedition to the mouth of the Orontes, and there was certainly every reason to rejoice in this arrangement; for not only was the George Canning taken in tow by the brig at all times when the weather permitted, but Commander Henderson and his officers secured the gratitude of every member of the expedition by their most efficient and zealous services in landing the stores.

The connexion between the George Canning and the shore having been established by means of a hawser extending from the ship across the bar of the Orontes, a distance of 1200 yards, parties were sent on shore by the Columbine and George Canning with tents for their accommodation; and the disembarkation was carried on with such spirit and activity, that the site designated "Amelia depôt" soon became a little camp, with a very mixed aspect, replete with bustle and useful occupations. The bar at the mouth of the river was at all times dangerous, and on one occasion Commander Henderson, with his boat's crew, narrowly escaped a watery grave.

The observatory being fixed, Lieutenant Murphy applied himself to astronomical observations, more especially with the transit instrument that had come out with the expedition. The survey was soon afterwards begun under Lieutenant Murphy, Mr. Thompson, and Mr. Stenhouse (who was sent by the admiral), at Ládikíyeh, or Ládhikíyeh (Laodicea), but was limited to a determination of the outline of the coast, with its soundings, and an examination of the coast itself. Mr. Ainsworth also accompanied the party for purposes of natural history.

The sites of Heraclea and Possidium were recognised. On their return, an excursion was made to the summit of Pliny's Wonder, Mount Cassius or Jebel el Akra'.* The succession of the various forms of vegetation was noted. The party bivouacked near the summit, on which, April 28th, there still remained some patches of snow. The results given by the barometer, which was observed at various heights, compared with a register kept at the

* Mount Bald.

same time by Lieutenant Eden, R.N., in the depôt, coincided closely with those obtained trigonometrically by Lieutenant Murphy, and which gave for the elevation above the sea 5318 feet; but this mountain, notwithstanding its great height, is entirely composed of supracretaceous limestones, characterised by cones and cerithiæ. At its north-eastern foot is an extensive deposit of highly crystalline gypsum, and, to the south-east, diallage rocks and serpentines break through the same formations, accompanied by lacustrine marls and silicious limestones.

On the 29th April a party, consisting of Lieutenant Murphy, Mr. Ainsworth, and Mr. Thompson, left the Orontes in a country boat to commence the survey of the Gulf of Iskenderún and its neighbouring shores. The first points visited were Arsús and Rhossus; an ascent was then made to Jebel el Ṣaïr,* on which they bivouacked. Next came Iskenderún, and in its neighbourhood Jacob's Well, the site of Myriandros; to the south the pass of Beïlán, gates of Syria (Ptolemy), Amanian gates (Strabo), a defile in the mountains separating Amanus from Rhossus, and leading from Myriandros into the plain of Antioch† or El' 'Umk.

To the north are the remains of a marble gateway, commonly called Jonas' Pillars (Cilician Gates of Ptolemy, Q. Curtius, and Arrian); this place was the midnight halt of Alexander. The description of Xenophon refers to a narrow place contiguous to the sea, that of Arrian to the ascent of the hills that shut up the same plain contiguous to the sea. The latter applies itself distinctly to these ruins. Half a mile north of the Cilician Gates is the river Merkez-ṣúï (Carsus), and beyond a wall terminating in the sea, with a tower at the foot of the mountains; the Carsus passes between two walls near the village of Merkez. This is the wall and gates of Xenophon: they are built of stone. Farther north is Bayás (Baiæ Anton. Itin.) Myriandros of Williams's Geography of Ançient Asia; and there are several populous villages between Bayás and the river of Issus (Pinarus). At a subsequent period, in company with Colonel Chesney, this river was examined in detail, and also the ruins of a considerable town near some hills which enclose the Issic plain to the north-west, the Jáwur Dágh‡ or Amanus being east (pass of Darius, Amanian gates of Arrian), the whole corresponding closely with the latter historian's description. Where the gulf runs to the west there are ruins of forts, castles and gateways. From thence, proceeding north-west by Ḳúrd Ḳúlák (Wolf's Ear, near Tardequeia of D'Anville and Rennell) to Miṣṣíṣah (Mopsuestia), at a pass through low hills of sandstone, are the remains of a road and

* Little Castle Mountain. (Abulfedæ Tab. Syr. p. 165.) † Anṭákíyeh.
‡ Heathen's Hill.

archway, constructed in part of sandstone, but chiefly of polygonal masses of basalt and lava, which no doubt have given rise to its name, Demir Kapú (Iron Gate), and Kará Kapú (Black Gate), the Armenian gates of Ptolemy, (Amanicæ Pylæ of Colonel Leake,) Upper Armenian gates (Rennell), Tímúr Kapú,* or the Gate of Tamerlane (Mecca Itinerary by Geographical Society of Paris). From hence the party visited Ayás (Ægae), the mouths of the Jeïhún (Pyramus), where an interesting examination took place of the progress of alluvial deposits. The most westerly point reached was Kará-tásh, the site of Mallus and Megarsus. The whole of the party being sick, the pass of Beilán was the only position examined on the return to Antioch.

In the neighbourhood of Amelia depôt the points of most interest were the course of the Orontes, examined by Lieutenant Cleaveland, Messrs. Eden, Charlewood and Fitzjames; and the ruins of Seleucia Pieria were also made the object of interesting researches about the same time that various other undertakings were in progress. The gentlemen already named, in conjunction with Messrs. Hector and Bell, were in turns employed on different points, repairing and widening the road from the mouth of the Orontes to Antioch, a work of considerable labour, especially in making the fords over the rivers practicable for waggons. Major Estcourt and Dr. Staunton had gone on a journey to the civil governor of Syria at Damascus, visiting, as they returned, Ba'lbek and the cedars of Lebanon. Lieutenant Lynch was employed in improving the line of route from Antioch by Jisr Hadíd to Bír; and lastly, Lieutenant Cockburn was employed (after Major Estcourt's visit to Reshíd Páshá at Diyár-bekr) in throwing up some slight field-works, and constructing slips at a spot selected for this purpose one mile and three quarters below Bír, on the river's bank, and designated as Port William.

To avoid the mischievous effects of idleness, as well as to carry the heavy weights to Antioch by water (when denied all other means by the local government), the Tigris was put together at the Orontes during the month of May. Towards the middle of June commenced the despatch of light stores on camels and mules, and towards its close some trains of waggons† passed through Antioch carrying heavy weights; but this being found a dilatory operation, the water communication was looked to once more, along a new line, which promised many advantages.

The Orontes, the Lake of Antioch, and the Kará-sú were therefore examined, and upon the reports and maps thus ob-

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* Or rather Temir kapú, iron gate. (Recueil de la Soc. de Géographie, tom. ii., p. 103.)—F. S.

† Twenty-seven vehicles of different kinds were constructed at Amelia depôt, and there were thirty-three, including the waggons, from England.

tained, the commander ordered a depôt (the 2nd) to be formed at Gúzel Burj (Pretty Tower), a village on the Orontes, three miles above Antioch, where the infinite variety of baggage, including the more ponderous objects, such as boilers, the eight sections (into which the Tigris had been divided), diving-bell, &c., were to be put on rafts, flat boats, and pontoons, in order to be transported by the Orontes into the Kará-sú (black water), and along this navigable stream into the lake, keeping along its western side on account of the deeper water, and ultimately ascending the ultra Kará-sú to a spot called Murád Páshá, near the village of Gúl* Báshí (head of the lake), a little beyond the junction of the Aswaud and Egri† Rivers, the whole distance being fourteen hours from Gúzel Burj. The abundant spring, called Gúl Báshí, issues out of a pseudo-volcanic mound rising out of the plain. The bridge of Murád Páshá is chiefly a causeway resting on the soil, but in part supported by arches, and crossing that part of the plain of el 'Umk, which is most liable to be inundated, for a distance of about three miles. This plain is inhabited by pastoral and nomad Turkománs, living in tents, who are a quiet people. The ancients appear to have known in this tract the rivers Ainaparos, Arceuthus, Labotas, Ufrenus, and the ditch of Meleager. The actual affluents of the lake are the Aswad,‡ the Yaghrá (uniting to form the Kará-sú), the 'Afrín, traversing the Cyrrhestica, the rivulet of Hárim,§ the Amgúlí|| and the Orontes; but the first-mentioned have various tributaries to the north with different appellations. On the road to the valley of the 'Afrín are some thermal springs, Al Hammám (the baths), issuing at the point of junction of Plutonic rocks with tertiary dolomites. The waters of these springs are said to have originated in different earthquakes, and present corresponding differences of temperature.

It is a distance of about 111 miles across the Syrian Desert,¶ from Murád Páshá to Port William. The first part of it is hilly, but not unfertile between Al Hammám and 'Azáz, (Minniza of Ant. Itinerary;) the summit level of this hilly region being 1723 feet above the sea. The second part, from 'Azáz to Port William, is for the most part level, at the best undulating, containing the valleys of the Koweïk (Chalus) and the Sájúr; the first of which is in this line 1263 feet, and the Sájúr 1363 feet (in its bed), above the level of the Mediterranean. These plains are everywhere fertile, for the most part cultivated and abounding in populous villages, consisting of Felláh** Arabs, Kurds, Turkish

* Geul, according to the French, or göl, according to the German orthography, if pronounced as at Constantinople.—F. S.

† Egrí, *i. e.* crooked. ‡ Black, *i. e.* kará. § Or Herem. || Or Emgólí.

¶ Quarterly Review, No. 97, Captain Chesney's Report. ** Husbandmen.

tribes and mixed races, possessing bullocks in great abundance along the whole of the direct line, which passed a little way southward of 'Aïn-táb, the ancient Antiochea ad Taurum, and now a garrisoned town of large size and some commercial importance.

The general arrangements for the transport were, that Lieutenant Cleaveland and Mr. Charlewood were to convey the boilers, &c., to Gúzel Burj, from whence they were to proceed under Mr. Fitzjames to Murád Páshá by water, to be conveyed from thence to Port William by Major Estcourt, assisted by Lieutenant Eden; and as there was a line of waggons connecting the boats with the sea on one side, and the Euphrates on the other, the three portions of the grand line were simultaneously in operation, and also a fourth, viz. camels and mules carrying the light stores direct from Amelia depôt to Port William, by the Antioch route, through Jisr Hadíd. Lieutenant Cleaveland obtained bullocks with a moderate degree of difficulty, and his ingenuity and perseverance* did† the rest, by removing everything to Gúzel Burj, where they were successively embarked for Murád Páshá; but here things were at a stand-still; and although the strongest orders were constantly issued by Ibráhím Páshá, very few bullocks could be obtained even at the highest prices by Major Estcourt, whose unwearied efforts could only secure the tantalising but ingenious result of an abundance of bullocks along the whole line, except the first and last stages; consequently the boilers which had remained from ten to twelve weeks on their carriages, might have continued at Murád Páshá until now, if we had not exerted ourselves to bring them on one at a time with our own horses, instead of bringing on a number of the heavy weights at the same time with bullocks; and the result was, that the officers and men had to toil along the great line of route from Murád Páshá, exposed for months to the great heats of noon, the chills of night, and to the baneful effects of what Humboldt expressively calls an extreme climate, the thermometer being as high as 110° in the shade (July), and as low as 8° in the winter, during which some of the boilers were flooded and the diving bell actually lost in an extensive sheet of water near Al Hammám.‡ The Euphrates being already complete, bullocks were given to perform the impossible task (as it was thought) of bringing on the Tigris boilers, which were warped out of the lake by manual labour, and ultimately taken to Port William, by Lieu-

* Eight hundred and forty-one camels and 160 mules were employed in all; and the greater part of these caravans were stopped on the frontier by the Páshá, in order to cause delay, by forcing us to bring others from the Sultán's territory.

† In addition to pulleys, &c., the boilers were actually moved up the hills inch by inch with jack-screws, by Mr. Charlewood and Lieutenant Cleaveland.

‡ Mr. Hector found the diving-bell by means of long poles, and then rolled it under water, for the most part half a mile, to its carriage.

tenant Cleaveland, Messrs. Eden, Charlewood, and Hector, the only officers then effective. Not one individual officer or man employed in this enterprise escaped at least one serious illness; nor is it at all surprising that some fell* victims to trials so long continued, and to a climate so often replete with morbid miasmata as Murád Páshá, the worst of the stations; yet the malaria only proved fatal when other causes combined to render it so; nor need the splendid scenery or the magnificent climate of Syria be approached with fear, for its malaria is not a pestilence; and the circumstances under which the expedition was placed, toiling on lakes and rivers, dwelling in the marsh with almost reckless exposure to the mid-day sun followed by the dew of night, require a separate consideration, and perhaps the surprise will then be that a greater fatality did not occur amongst a body of men (about eighty-five) in general unseasoned, during the laborious and almost unexampled transport of two large iron steamers,† which were subsequently set up, with the engines, &c., quite as safe and even more perfect in their working details than when sent out of the makers' hands at Liverpool, notwithstanding a long journey, with all the difficulties which could be thrown in the way, underhand, by the local government.

Previous to taking medical charge of the station at Murád Páshá, Mr. Ainsworth had made an examination of the less frequented countries immediately south of Antioch. He crossed the mountains at Beït-el-Má‡ (the Daphné of Pococke), and entered forests which covered a great basin of tertiary rocks, chiefly cerithea limestone, silicious limestone, and lacustrine marls with gypsum everywhere broken up and dislocated by serpentine and diallage rocks. It is only in the valley of Antioch that the pliocene formations show themselves, and enabled Mr. A. to determine the period of the elevation of the Plutonic rocks of the silico-magnesian series. From Ládikíyeh he followed Maundrell's route, by the country of the Maronites and Jebel-el-Akrád, the northern prolongation of the mountains of the Nosaïriyehs, and by the valley of Bedamé,§ rich in scammony (Convolvulus scammonia), to that of the Orontes, which he joined at Jisr Soghcïr,‖ the Larissa of Gosselin and Seleucus Belus of D'Anville. A Roman road led to Kal'at-el-Mudík,¶ where are ruins of a highly ornamental character. Part of the town is enclosed in an ancient castle, situate on a hill; the other ruins lie in a plain; part of a strong

* Seven men of the expedition, and one workman.

† The labour fell chiefly upon Major Estcourt, 43rd Light Infantry, Lieutenant Cleaveland, Messrs. Eden, Charlewood and Fitzjames, R.N.

‡ Beït-el-má (water-house) is an ancient aqueduct leading to Duweïr (Little Convent) the ancient Daphné.—F. S.

§ Beït-al-mà.—F. S.

‖ Little Bridge.

¶ Castle of the Defile, near Fámiyah (Apamea).—F. S.

wall and an archway still exist, and also the remains of a temple. In the adjoining lake are the celebrated black fish, the sources of a distant commerce, which were recognised to be the Macropteronotus niger of naturalists.

From Mudík he visited the little centre of primitive Christianity in the mountains of Ríhá and Edleb, abounding in monuments of a hierarchy then new, and he returned subsequently by the borders of the great plain to Antioch.

At this period, August 1835, Lieutenant Murphy commenced the grand line of levels from the Mediterranean to the Euphrates with reference to canals, and other objects of deep interest connected with science. Many obstacles occurred at first; prolonged malaria had unfitted all for exposure to the sun; Lieutenant Cockburn and Mr. Thompson, after a short exertion, were both laid up; Lieutenant Murphy was also seriously ill. Ultimately, after another beginning, the last-mentioned industrious officer started for Port William, where he was required in the observatory, and the levelling was continued by Mr. Thompson, who completed this important part of the original plan, and by which the bed of the River Euphrates is determined to be 628 feet above the level of the Mediterranean.

Nearly at the same time a party, composed of Lieutenant Lynch, his brother, Mr. Staunton and Mr. Elliott, set out on a mission of a friendly nature to the Arabs. They visited the tribes of Wuld, 'Anezeh, Gízeh, the Bú Sipáhí and some of the Turkomans, from all of whom they met a favourable reception. The 'Anezeh alone showed a doubtful disposition, and the Bú Lilchí, one of their tributaries, wounded one of the servants severely.

This hostility did not, however, appear to be directed against the expedition so much as with a view of plundering those gentlemen who had ventured amongst them; and the sheïkh immediately offered to compromise the matter by presents, which were declined as a matter of policy, in the hope that an unsettled affair of blood may tend to keep the 'Anezeh in better order as regards their future intercourse with the expedition.

In the early part of January last, Colonel Chesney left his bed, and was actually put on his horse to prosecute a scientific journey to Mount Taurus and part of Asia Minor; he was accompanied by Lieutenant Murphy and Mr. Ainsworth, both invalids; also Mr. Staunton. The party proceeded by 'Aïn Táb to Kilís, and thence to the eastern acclivities of Amanus, in the parallel of Issus, but no passage could be effected at that season of the year. Repelled to the south, the mountains were passed by Bagrás, through the Beïlán pass, to Iskendrún, from whence the party proceeded by the Cilician gates and Bayás, to the plain

of Issus, sufficient time having been devoted to the examination of the various questions of historical geography connected with this most interesting district; the great road towards Constantinople was followed by Demir Kapú and Kúrd Kúlák, "the Wolf's Ear," Tardequiea, and by the plain of Chókúr Ovah, "the Plain of the Pit," crossing the Jebel en-núr, "Mountain of Light," bearing on its rocky summit to the north Sháh Márán,* "the Castle of the Serpent," and along the left bank of the Jeïhán Sú, "the River Gihon,"† to Missísah,‡ the ancient Mopsuestia, now almost in ruins, but once, like Tarsus, one of the chief cities of Cilicia. From Missísah the party continued across the plain by Adanah (head quarters of the Páshálik) to the last-mentioned town, where they found the French consul, Mons. Gilet, engaged in excavating a monument close to the place, of great solidity, and apparently very remote antiquity. It consists of an inclosure in the form of a parallelogram, with two masses within of similar form nearly, one at each extremity; also two massive transverse parallelograms at the eastern extremity. The walls and masses were of the most solid construction, without the least appearance of any thing like a sepulchral chamber in any part of this extensive mass, at least as low down as the level of the ground around it.

The road followed on leaving Tarsus led over the sub-alpine country at the foot of Taurus, consisting of tertiary rocks in great variety near the centre of the Tauric chain. The lead mines of Kule Bógház were visited; they occur in limestones belonging to the cretaceous series, and are in the valley south of the grand pass of the same name, but worked injudiciously. The pass itself was then examined almost to the summit-level, and the party regained the more level country on the south side of the Great Mountains in order to visit the town of Sís, and the border territories of the Sultán and Páshá; here the inhabitants have so bad a name that no muleteer or guide could be induced to proceed along the mountains in that direction; and whilst overcoming the difficulties made by the alarms of the people, Colonel Chesney and Mr. Ainsworth were separated from the rest of the party, and made their way to Sís on foot by one line, directed by the compass alone; whilst Lieutenant Murphy and Mr. Staunton reached it by another; each traversing a romantic and beautiful country formed by the wooded abutments of Taurus, and peopled by well disposed peasants, instead of being all robbers as they

* Yílán kal'eh-si; also called Sháh Márán Kal'eh-sí, *i. e.* "King of the Serpents' Castle." Jihán-numá, p. 602. Yílán signifies serpent in Turkish, Már in Persian.—F. S.

† Jihán, "World," is not spelt with the same letters as Jeïhán or Jaïhán, the Arab corruption of the Hebrew Gihon. Jihán is Persian; Jeïhán Arabic; but by the Turks these words may easily be confounded.—F. S.

‡ Vulgò, Misís (Otter, Voyages, i. 71).—F. S.

were represented. During about 125 miles of country, composed almost entirely of tertiary sandstone (Ostracite sandstone of Kupffer), they crossed the Seïhún-Jeïhún, the Korrykoon, and several smaller but good sized rivers, watering this interesting country, which terminates at Sís, the residence of an Armenian patriarch, the third in importance at the present day, with a respectable palace, and a large convent in his charge. Whilst at Sís an expedition was made into Mount Taurus, and the mountain of Kará Sís, "Black Sís," ascended, after crossing a part of the crystalline-plutonic formations. The researches were then directed towards Anazarba on the plain: the ruins of the city are still extant, backed by an isolated mountain, bearing a castle of various architecture. Such solitary hills rising out of the plains are not unfrequent here, and they mostly bear castellated buildings on their summits, as Sís, Sháh Márán, Túm, Anazarba and others. From Anazarba the party crossed the plain, village, and district of Khás, and there entered the mountainous country which led by Anabat to Mar'ash. The chain was not crossed without much difficulty; the narrow pathway was carried alongside and down precipices that were very steep; so much so, that it became necessary several times to unload the horses and carry the baggage over the most dangerous places, on one of which a horse was hurled downwards until brought up by a tree. The culminating point of this part of Taurus is called Durdún Dágh; the chain is composed of mica slates, clay slates with graphite or plumbago, quartz schists, quartzites and diorites, with uplifted limestones belonging to the supracretaceous series. The great and massive mountain which rises above Mar'ash, and there known by the name of Agrá Dágh, consists of tertiary sandstone, and limestone, tilted up and reposing on serpentine and diallage rocks, which would indicate different geographical connexions. The direction of Agrá* Dágh is nearly from S.W. to N. E.; that of the schistose chain of Durdún Dágh, a little south of east; that of Jáwur Dágh (Amanus) is the same as Agrá Dágh, and its structure is also the same. Colonel Chesney returned to Port William from Mar'ash, leaving directions for the remainder of the party to proceed in the direction of Someïsát, O'rfah, &c.; but being thrown back on Rúm-kal'ah† by the swollen rivers, they returned to Port William, surveying the river between those places. During the whole period of their progress the positions of the principal places, ancient and modern, were determined astronomically by Lieutenant Murphy, and careful itineraries kept in addition to bearings, taken, when practicable, with the theodolite, or Kater's compass, according to circumstances. The

* Yaghrá.—F.S. † Rome's Castle. Properly Rúm kal'ah-sí.

result of these labours has been, in the first place, to connect the surveys of the coast of Ládikíyeh and Issus with those of Captain Beaufort; and in the second, to carry on these surveys to the Euphrates.

On the day following the return of the first party, another was sent out by the commanding officer to finish that part of the plan which had been interrupted. This one consisted of Lieutenant Lynch, Lieutenant Eden, R.N., and Mr. Ainsworth. Agreeably to the instructions received, the party took up the former work at Rúm-kal'ah, proceeding from thence along the left bank, carefully surveying the river as far as Someïsát, the birth-place of Lucian. The ruins of this celebrated place are just recognisable; the modern town small and poor, but the valley itself fertile as it is described to have been in former times, and ferry boats are still kept up to pass the river to and from O'rfah. The course of the Euphrates from this ancient Zeugma to that above Bír, differs from what has been represented on most maps; it flows, in fact, in the general direction of south-west, and is not turned, as an incorrect reading of Strabo would infer (Rennell and D'Anville), to the south-east.

Someïsát having been fixed, it was then connected astronomically as well as by an itinerary with U'rfah (Rohá, O'rfah,* with its progress of corruption; Callirrhoe, Edessa, Justinopolis and Antiochia under successive masters). To the north of the city are evidences, in cones, lines and circles of elevation, of pseudo-volcanic action. The fish venerated so much in ancient times are still preserved in the marble basins of the mosque of Ibráhím Khalíl, and were recognised to be a kind of barbel. From O'rfah the great Mesopotamian plain was crossed in the direction of Harrán; "Carræ clade Crassi nobiles,"† and still more interesting as the residence of Abraham. Harrán was also connected with its rival in antiquity, Serúj, of which scarcely any vestige remains. In the plain around the ruined site of the latter place, the party met two colossal lions sculptured in basalt with refined taste (basanite, basalt with disseminated augite). These may possibly be the remains of that vanity which prompted Antoninus Caracalla to assert that a lion fought by his side in his Parthian wars.

Dr. Helfer having been separated from the rest of the party when proceeding towards the Taurus, a journey then made by him to the Salt Lake, south-east of Aleppo, led to the discovery of an ancient city near a basaltic range, four hours south-east of the lake. There are some remains of a temple and several

* It is more than doubtful whether Rohá and O'rfah are derived from the last part of Callirrhoe.—F. S.

† Plinii Nat. Hist. v. 24.

Greek inscriptions which have been furnished, with a detailed description of this hitherto unknown place, by Dr. Helfer.

Early in February an opportune reinforcement arrived, consisting of four sappers from England, and six seamen from the Columbine, which restored the expedition to its original strength; and the experiments with the pendulum, dipping needle, and other instruments being completed, the expedition was put in motion on the 16th March, the Euphrates taking the lead to survey, and give the benefit of rough charts, and a pilot to the Tigris, in order that she might follow at one or, at most, two moves, and thus spare fuel as much as possible.

Previous to the actual descent, the Euphrates passed up rather a bad rapid, and stemmed the strong current as far as the town of Bír, in the most satisfactory manner, displaying the Sultán's standard, and saluting him with 21 guns, which were returned from the castle, and by the acclamations of the astonished Moslems, who crowded both banks to be really certain that iron could be made to float, and to surmount the force of a current, now overcome for the first time, and "God was blest for such a creation, and sending men amongst them, ten of whom could take their town."

The first 101 miles of the river were carefully surveyed, in the following manner. A boat was despatched ahead, usually for a distance of 20 or 25 miles, sounding and taking bearings, which being placed on paper, when the officer returned, he became pilot to the vessel for the distance examined, and a second set of bearings with a double set of soundings were taken from the vessel's deck. Simultaneously with the water operations thus carried on by Lieutenant Cleaveland and Messrs. Eden, Charlewood, Fitzjames and Hector, there were two other sets on land, viz. a chain of ground, trigonometrical angles along the principal heights, based on astronomical points, by Lieutenant Murphy, R.E., and a smaller one, with a succession of short base lines from bend to bend, by Major Estcourt.

The land as well as water parties naturally involved much intercourse with Arabs, who have shown themselves well-disposed, except in one instance, when it became necessary to fire a nine-pounder blank to save a sheïkh, their enemy, who was attacked whilst in our boat.

The state of the river was very favourable, although the Euphrates was once aground, owing to the deception caused for the moment by a bright meridian sun; but the deep part of the river was 420 yards wide at the spot in question, where we remained some days digging the vessel out, nor did she suffer in the slightest degree.

The survey of the river Euphrates, as far as Bális,* by Major Estcourt, and by Lieutenant Murphy, was laid down, and a copy transmitted to England. After some demonstrations of a hostile nature, the 'Anezeh, the most powerful among the Arabs of the desert, had earnestly sought and obtained a treaty of friendship and alliance. Several new or rare animals had been added to our collection. The existence of the beaver, either in the Euphrates or its affluents, had been ascertained. One of the family of crocodiles had also been observed.† The flora was that of spring, rich in the gorgeous forms and beautiful colours almost peculiar to the East. The Amaryllideæ, Asphodeliæ, Liliaceæ and Melanthaceæ afforded an abundant harvest.

From Bális the survey was carried on partly in boats, in which the duty was alternately performed by Lieutenants Lynch, Cleaveland, Eden, Messrs. Charlewood, Fitzjames and Hector, and which had in view the soundings of the river, as well as the recognition of its geographical features. Lieutenant Murphy continued to fix, by astronomical means, every important point, and, indeed, any station where an opportunity was afforded to him. This was continued as far as to 'A'nah; but the Euphrates and Tigris steamers having joined company at Giaber, a degree of celerity was given to our movements, which was found to be incompatible with this mode of survey, and as additional security was given by allowing the Tigris to lead the way, she drawing considerably less water than the Euphrates, the survey was now carried on almost entirely by Colonel Chesney, by a system of bearings carefully taken from the deck of the steamer, accompanied by double soundings, and by the astronomical determinations of Lieutenant Murphy.

The site of the forests of the kings of Syria, at Bális, still abounds in wild boars, and the wilderness around with wolves, jackals and foxes; at this place commences the growth of the tamarisk, the most frequent and the most abundant plant on the banks of the Euphrates, from hence to its embouchure; twenty-three new plants which show themselves at Bális, follow for 140 miles down the river. The castle of Ja'ber,‡ the next place visited, according to Golius named Daúser, after its founder, by a tradition of the natives, would appear to owe its origin to Alexander the Great. It is built on a mound of marl and gypsum. The ford in which Soleïmán Sháh was supposed to be drowned still exists. The attention of the expedition was now called to El

* Abulphedæ Tabula Syriæ, p. 65, 130.—F. S.

† Living specimens of the Trionyx Euphratica, and of the Trionyx of the Orontes, which differed specifically from that of the Euphrates, had been transmitted to Europe.

‡ Kal'ahi Ja'ber.

Hammám, a camel's ford; a distance of forty-five miles (fifteen parasangs) from Bális, is equivalent to what Cyrus made in three days' march, and the point where, in all probability, the 10,000 Greeks and the army of Alexander crossed the river Euphrates. There are still the remains of a well-constructed causeway, which leads to the ruins of Sura (*Flavia firma Sura*), from Resáfah, a city on the great road of Roman and Palmyrean commerce. On the northern side of Thapsachus two ancient castles and the remains of a causeway are met with on the road which the Macedonians held in their way to Nicephorium, formerly Calne (Benj. of Tudela, Gen. x. 11); but subsequently Calonicos (Abulfaragius), and Callinicum (Strabo, Pliny), and Rakkah under the caliphs. The ruins of this place were examined, and astronomical observations, probably the first since the days of Al-Bategnius (Al Batání), were taken in the walls of Hárún al Rashíd's palace.

The forest of 'Arán, south of Rakkah, consists chiefly of poplar trees (Gharab* of the Arabs, which has been mistaken for a willow), of mulberry, tamarisk, brambles, clematis, a lygeum, and an Asparagineæ, which wind like creepers amidst the dense underwood. The forest furnished a new species of Gerbillus, differing from the G. Tamaracinus of Pallas, which it otherwise most approaches, being, including its tail, seventeen inches in length; Pallas's quadruped is only six.

The winding and tortuous Euphrates led hence to a rocky pass of tertiary deposits covered by a volcanic formation, which shelter the marble walls and antique ruins of Zenobia, a custom-house, and probably a summer residence of the Palmyrean Queen. High on the cliff to the left, and on the opposite bank of the river, is the ruined castle of Zelebi, probably Cis and Ultra Euphratic Zenobias. With respect to natural history, this place is not so interesting as Bális. There were no quadrupeds; of birds, the turtle dove, magpie, graculus, hawks, and partridges were tenants of the solitude. Among the plants, umbelliferæ began to predominate. There were also beds of allium.

A sombre country with brushwood and marsh, with an occasional village of Arabs, now inclosed in forts with quadrangular mud walls, extends from hence to the small town of Deïr. Flights of locusts were passing by. There we obtained bitumen in a solid form, resembling lignite, and experiments were made upon its combustibility and adaptation to the furnace of the steamers. The navigation from Deïr to Kerkísiyá (Cercusium) lay through a level country, chiefly marsh, with districts of tamarisk and some cultivated lands. The Tigris succeeded in ascend-

* The Gharab (for so the Kámús and Siháh spell it) is the white poplar.—F. S.

ing the Khábúr (Araxes) for miles. The opinion advocated by Colonel Chesney, that this is the river which Trajan, after building his fleet in Singar, descended to the Euphrates, clears up many difficulties in the contradictory reports furnished to us by the historians of the time, who carry the emperor down the Tigris to Babylon (Dion. Cassius, edit. Reimar. Hamb., lib. 63, chap. 26). Julian, who professedly followed Trajan's steps, according to Ammianus (edit. Wagner, Erfurdt, lib. 23, chap. 2), also embarked at this place and sailed down the river Euphrates. Mosquito persecution began at this otherwise interesting spot, and the foot-prints of lions were visible on the river banks.*

The country preserved nearly the same character to the small town of Mayertheïn, which is built at about three miles and a half from the castle of Rahabah itself, on or by the site of an ancient city of the same name. Amid the stones of the modern castle occurred numerous light bricks, with surfaces covered with vitrified bitumen of a dark green, in the same manner as is observed at Babylon. The name remounts to the highest antiquity, if such an association can be established (Gen. x. 11). The next day's journey brought us to the ruins of a considerable place, now called Saláhíyah.† The walls, a noble gateway, and an extensive castle, are all that remains; but these relics were imposing from their appearance of massive simplicity. The country around is a red stony desert. The ruins are tenanted by the Tartarian wolf, a ptyodactyl gecko clambers on the walls, a long-limbed pimelia runs across the desert; but the river flows in a valley nearly 300 feet below, where there is vegetation and abundant animal life. A new and peculiar form of the family of Laridea, apparently peculiar to the great waters of the Euphrates, was first met with in these parallels.

The day of our departure from Saláhíyah was marked by a fatal phenomenon. A dense cloud of dust, raised by a local wind, came travelling across the desert, accompanied in its onward progress by large torrents of rain, which poured their incessant waters upon the darkened earth. The hurricane, which entailed the loss of the Tigris, exceeded what had occurred in the memory of the oldest inhabitant. They call it fatúl.‡ During

* The vegetation of summer was characterised by woolly, thorny and aculeated plants. The soil had become brown and fallow. The splendid colours of flowering bulbous plants was succeeded by an infinity of rude species, chiefly Compositæ, most numerous, both in individuals and in species. Papilionaceæ were also frequent. But mixed genera, as Artemsia, Glycherrizeæ, Mimosæ, Ononis and Tamarisk, occupied alone, and to the exclusion of all other forms of vegetation, the most extensive tracts.

† From Saláhu-d-dín, *i. e.*, Saladin.—F. S.

‡ This word, not found in our Lexicons, signifies "twisted," "twirled," and thence, a "whirlwind."—F. S.

its prevalence the barometer fell two-tenths of an inch, which is a great quantity in a climate where the irregular oscillations are almost null. Under so extraordinary a trial, no effort that skill could invent, or courage put in practice, was spared to save the Tigris, but in endeavouring to make a-head against the whirlwind she was overwhelmed, and sunk by a power as resistless as it was little to be expected. In half an hour the sun shone in unblemished brightness, and the desert wind blew calmly, where she and the greater part of her brave crew had been. When Julian was at ''Anah, Ammianus relates that there occurred a "terrible event;" whirlwinds which blew down the houses and tents, overthrew the soldiers, and caused many boats to sink. The site of the Corsote of Xenophon* and of the town of Ezra,† probably a colony of captive Israelites, were in sight of the locality of this sad catastrophe.

From Ezrah, the remainder of the expedition directed itself by El Káyim to ''Anah, the earliest country of date groves, a rock-enclosed and picturesque town. On the right, at the rocky passage of Karábilah,‡ is the small town of Rawah. In the river, two islets, with tombs and mansions embosomed in shady groves. The river curves suddenly round a rocky point, and a long interminable vista of date groves, and eight successive islands similarly adorned, with the habitations of the people peeping here and there from the dense foliage of pomegranates, and other shrubby trees, announce the town of ''Anah, which occupies a fringe of soil on the river bank, between a low ridge of rock and the swift-flowing waters.

The castle of ''Anah, whose ruins occupy one of the islands, was built by the Greeks, destroyed by Julian, reconstructed by the Saracens, and destroyed by the Bedowins. The people settled at ''Anah are a branch of the Ommiades, or Beni Ommaïyah. In Olivier's time it was governed by an Arab Emír; it is now under the Páshálik of Baghdád. The site of the ancient city is on the left bank, a little below the present town.

The expedition on its way to Hít passed the islanded villages and castles of Haddisa and Jubbah; the latter the Jubba of the Romans, was ineffectually summoned to surrender by Julian. At these an unexpected proffer of allegiance was made by the chief of the tribes, who, wearied and harassed by the constant spoliation of the Bedowins, scarcely dare venture to till the land where an inefficient government affords no security to property, and these, among the most respectable and industrious of the Arabs, were anxious to profit by the stability which would accrue to commercial

* Anab. i. 5, 4.
† Probably Irzah, and, by transposition of letters, Izrah, *vulgò* Ezrah.—F. S.
‡ That is, "Sieves."

or agricultural establishments in the river by the opening of its navigation. Hít, the ancient city, so celebrated in all antiquity, was our next station; its never-failing fountains of bitumen, visited by Alexander and Trajan, now cover the Gopher boats of the Euphrates and asphaltic coracles of the Tigris, but beyond that, are converted to little or no use. The trade in salt, obtained by the evaporation of the water of the same fountains, is however considerable. Hít itself is a small town; celebrity alone has not conferred riches.

The high minaret of Mesjid Sandábiyah stands upon almost the last promontory of rocky land that flanks the Euphrates; and already to the east low and level plains, in part inundated, have succeeded to an undulating and more diversified country, and stretch to the confines of the visible horizon. At this place the Fort of Felújah announces the shortest line across the head of the Alluvium to Baghdád and the neighbourhood of Nahr Malikah, or Royal Canal.

While the steamer proceeded without any remarkable occurrence to Ḥillah,* visiting in its way the ruins of Babylon, a party proceeded by land to the ruins of Aker Ḳúf (Accad), where an extensive inundation separated them from Baghdád. From the latter city they returned by the chain of Kháns on the plain to the Mujellibeh † and Ḳasr ‡ of Babel, thence to Ḥillah. Here the fanaticism of a moment threatened to destroy the peaceable understanding which had hitherto existed between the expedition and the Arab tribes; but happily the spark was extinguished without the intervention, although not without the manifestation of hostilities.

Díwáníyeh, the next station to Ḥillah, is a date-encircled and walled village with extensive gardens. It is approached through a continued country of date-trees, forming groves of exceeding beauty, and a fringe of verdant columns, whose uniformity seldom palls upon the eye; onwards to Lemlúm the country is low and less cultivated, and the eternal tamarisk covers whole tracts of land. The navigation of the river through the marshes of Lemlúm was attended with some difficulty to a large steamer; the bed is very narrow, the windings are numerous and abrupt, and the banks low. These difficulties had been anticipated, and their remedy has been pointed out. The country around the marshes

* The tomentose and spring plants were now in great part dismissed, to make way for succulent species. The genera, mesembryanthemum crassula, aster, salicornia, salsola and tragia, cover with their representatives the plains of Babylon and Basrah, and spread themselves wherever an alluvial soil, impregnated with marine salt, occupies, as it so constantly does, the great level tracts of Arabia, Mesopotamia, and Persia.

† Or Mujaliba, from Jalib, a slave, "The home of the captives?"

‡ Castle.

is sometimes below the level of the waters of the Euphrates, and the mat huts of the peasants, built upon the inundated rice-grounds, are often in a similar situation. No climateric fevers manifested themselves among the officers or crew during the time of their detention in the marshes. Shortly after our exit from the Lemlúm, an unfortunate collision took place with some Arabs of the Bení Hayákim tribe, originating in violence offered to men employed in cutting wood. After several attempts at a parley and reconciliation and enduring for some time their irregular musquetry, the commander of the expedition felt himself forced to retaliate, which retaliation, although carried to a very slight extent, entailed the loss of some lives among a people yet too confident in their own resources.

The town of Súk-el-Shuyúkh (Sheïkh's market) between Lemlúm and Ḳórnah, is the metropolitan city of the Montefike Arabs, and contained upwards of 10,000 inhabitants before the plague in 1832. It is still the seat of considerable inland commerce, and the place of exportation of the horses reared by the tribe to whom it is subject, and generally considered as the best that are bred in Turkish Arabia.

The Euphrates, from Súk-el-Shuyúkh to Ḳórnah, is a noble river; its bed is wide and deep, its waters clear, and its banks for the most part a wide extent of grassy plain or of reed marsh, which stretches as far as the eye could reach. At Ḳórnah, the confluence of the rivers Tigris and Euphrates, a Turkish sloop of war lay at anchor as superintendent of customs, and returned our salute.

Of the magnificence of the river formed by the union of the two above-mentioned streams it is unnecessary to speak here. On the 9th of June the Euphrates steamer arrived off Baṣrah, and celebrated its safe descent of the great river whose name it bore, gratifying, at the same time, the feelings of loyalty excited by the remembrance of the monarch under whose patronage this enterprise was carried on, by firing a number of guns equivalent to the age of a now much regretted monarch.

The anticipated absence of all facilities for ship construction, so strongly urged by the commander against those who advocated the putting together of the boats at this end of this river, now too plainly manifested itself, and not even sufficient to repair the wear and tear of the descent, not a plank nor a rope was to be obtained: under these circumstances, although the Euphrates was not by her construction adapted for the sea, as the weather was yet fine, Colonel Chesney determined upon crossing the head of the Persian Gulf to Abu-shehr, and there obtain his refitting: this was accordingly done, and the steamer arrived without any untoward circumstance at the mart of Persian commerce on the 23rd of June, four days after its arrival at Baṣrah.

It is almost unnecessary to remark that the prosecution of the survey, the annotation of the rock formations, the collection of a complete herbarium, and the general study of the physical character of the country traversed during the descent of this great river, continually occupied the time and attention of the gentlemen on whom each separate department devolved.* The health of the whole expedition had continued unbroken.

At Başrah, where the pendulum experiments were originally proposed to be carried on, Major Estcourt and Lieutenant Murphy were left for this important purpose. During the detention of the steamer at Abú-shehr, not only a complete set of observations on the various pendulums of the expedition were obtained, but also a set of valuable results in terrestrial magnetism, both in horizontal force and in dip, made in order to determine satisfactorily its intensity at this remote place. At the same time Lieutenant Murphy neglected no opportunity (which the clear skies of the country rendered numerous) of prosecuting those astronomical inquiries which the instruments brought out by the expedition enabled him to make. It is a painful task to have to conclude this notice of the labours of that able and indefatigable officer with the statement of his death. He fell a victim at once to an unhealthy climate and to an assiduity carried almost beyond the rules of prudence.

During the detention at Abú-shehr, Mr. Ainsworth made an excursion into the province of Fársistán as far as to the ruins of Persepolis. A section of the geology and physical structure of those curious passes, which were by the historians of Alexander and his successor denominated the κλιμακες, or ladders, and an exploration of the celebrated cave of Shápúr, were among the principal fruits reaped by this journey.

Colonel Chesney having waited for some time for the mail from Bombay, proceeded, in accordance with his previous arrangements, to forward a packet to Aleppo, for which purpose he sailed in the Honourable Company's schooner Cyrene, attached to the Residency at Abú-shehr, to Koweït or Ghoreïn, on the Arabian coast of the gulf: on the return of the small party who accompanied him, the island of Khárek † was visited, and an opportunity thus afforded for determining its structure.

The weather had now completely altered its character; strong breezes from the north-west had pretty constantly set in, the sea

* The extensive mud-banks of the Shatt el Arab furnished a peculiar form of that tribe of acanthi-pterygoid fish, to which the labyrinth form of the gills gives the property of living out of the water. In the present species, exceedingly numerous and active, increased powers of locomotion were given by a peculiarity in the arrangement of the operculum, by which three of its portions are united to form an osseous plate superadded to the thoracic fin.

† Khárïg, or Khárij.

was turbulent and uncertain; notwithstanding a continuation of very unexpected difficulties little to be looked for, which were thrown in the way of the refitting of the steamer and putting her as far as possible into a sea-worthy condition, the exertions of the officers had succeeded in so far perfecting her equipments, that it became desirable to take the first opportunity of re-crossing the sea, and awaiting the arrival of the mail in the river. Accordingly advantage was taken of an offer made for security's sake by Captain Hennel, Acting Political Resident at Abú-shehr, to allow the Honourable East India Company's sloop of war Elphinstone to take the steamer in tow, and in this manner the passage was effected at a bad season without any accident, as far as the mouth of the river, where the funnel having been mounted and the steam got up, she was left to her own resources, which soon took her to Mo'ammerah, a small but rapidly rising town on the Persian side of the river under the Ka'b* tribe of Arabs. After a short excursion to Makil, the house of the Honourable East India Company's political agent in Turkish Arabia, a little above Basrah, to fetch Major Estcoust and an invalid, an attempt was made to ascend the Kórnah, a noble river, which empties itself by the Bahamishír † and the Mo'ammerah channels, commonly called the Haffár, but the waters being at their very lowest, the steamer only succeeded in ascending a distance of seventy-five miles.

The day after her return to Mo'ammerah (September 9th) another exploratory journey was made for about forty miles down the Bahamishír. Considering the great interest which is attached to the chorography of the delta of Susiana or Khuzistán, the errors on this subject which teem in the most modern maps and charts, and the numerous questions in historical geography upon which they bear, it is natural to suppose that these examinations were carried on with great avidity for information, and with anxious hopes that a future opportunity at a better season might still be looked forward to for an application of the power of steam to further the highest interests of geographical science.

On Thursday, September 13, the Honourable East India Company's schooner, the Shannon, anchored off the mouth of the Mo'ammerah channel, having a home mail and dispatches for the expedition and for Turkish Arabia. In consequence, the Euphrates took its departure the same day, and proceeded by Basrah, taking in the French vice-consul, M. Fontanier, to Kórnah. Here, as there was not time sufficient to proceed up the Euphrates with the Shannon's mail and return for that expected, according to letters from Bombay, by the Hugh Lyndsay, at the

* Pronounced Cha'b, or Ja'ab, by these Arabs.
† Bakmeshir, according to Niebuhr.

latter end of the month, and on account of private intelligence received by the commander of the state of the upper countries, having no reference to the Arabs, the unexpected orders came to proceed up the Tigris river. This was accordingly done, although the difficulties presented themselves of a current considerably stronger at this season of the year, and of the numerous sand-banks and shoals, such as do not characterize the sister stream, and which rendered the navigation at the low season much more formidable. The Arabs were found peaceable; wood was met with in abundance on the banks of the river, and the Euphrates succeeded in ascending to Baghdád, in a period of 104 hours 31 minutes, being a distance from the mouth of the river of 543 miles 457 yards.

By the circumstance of the mail for England not having arrived during the early part of the wet season, the difficulties of the navigation of the Euphrates were very much increased, if not to the larger steamer rendered altogether insuperable, although the fears entertained upon that head were much diminished by the condition in which the Tigris has been found, and consequently, in the event of the arrival of the mail from India, the commander was still bent upon trying our success on that river.

In the mean time a party was landed at Baghdád to commence a line of levels from the river Tigris to the Euphrates, with a view to determine the difference of level between the two rivers, and also of assisting the often-expressed anxiety of the Páshá of Baghdád to establish a canal communication in that line, of so great importance in the international communications of the Asiatic nations, claiming for having been put in practice the most remote antiquity, and offering new views of commercial advantages to the opening of the navigation of these rivers.

The delay which had been experienced, from the Arabs having failed to cut wood, at the appointed stations, during the ascent of the Tigris, was further increased on the descent, which commenced on the 5th of October, by the circumstances of the people of the boats, which were to come up with coal to meet us, having got into some disputes with the Arabs, and returned back to Ḳórnah. Hence loss of time was entailed in cutting wood and burning it green, so that the steamer only arrived at Ḳórnah by the 16th, where she found the Hugh Lyndsay had been waiting since the 3rd of the month.

The day was employed in cleaning the engine, taking in coals, provisions, &c., and the next day the Euphrates sailed up the river with the Hugh Lyndsay's mail. The same night (Oct. 20) she anchored off Súḳ-el-Shuyúkh, and the next day brought-to

before Kút, the residence of the Sheïkh of Montefij,* with whom it had been rendered necessary to have some explanations, regarding a misunderstanding which had arisen between the Arabs and the crew of the Hugh Lyndsay; that vessel having unfortunately brought with her, as a passenger, a Mr. Samuel, who had before made himself extremely obnoxious in these countries by an injudicious crusade against the Mohammedan religion.

The ascent was continued on the ensuing day, and was prosecuted till the 25th, when it was necessary, as the steamer was now engaged in the very narrowest part of the river, where the water flows from the Lemlúm marshes, to unship the paddles and warp the vessel up the stream, sometimes assisted by the Arabs in towing. On the 29th, it was found, to our infinite mortification, that the cross-head of one of the air-pumps was cracked, which, as it subsequently appeared, had been caused by some gravel sucked in at the bottom of the pump, which had thus been obstructed in its working. Under these circumstances it was judged necessary to send forward Mr. Fitzjames, R.N., with the mail, in a country boat, and he was accompanied by Sa'íd 'Alí, an interpreter, and Messrs. Stewart and Alexander, passengers to England.

On the evening of the 31st of October the party arrived at Lemlúm, where they were hospitably entertained by the Sheïkh; but the next day were surrounded by upwards of thirty armed men, and a systematic pillage of the passengers' luggage took place in presence of the Sheïkh, who was performing his devotions at the time.

The pillage lasted two days, and at night they were guarded by a party of armed men to prevent their escape. The mails were not opened; and after being detained till the 8th of November in an Arab tent, by selling some clothes, &c., they raised money enough to pay a boat to Déwáníyah, where they arrived on the 9th. The town was beset by the Agra† tribe, and they were again detained till the 16th, when they got off in the night by stealth with a guard of armed men, and reached Hillah on the 19th.

Ultimately Mr. Fitzjames went to Baghdád, from whence he started for Damascus with four camels, carrying himself, Sa'íd 'Alí, the mail, and two guides. He arrived at 'Anah the 8th, at Damascus the 18th, and at Baïrút the 26th, where the steamer did not arrive till January 4, 1837.

In the mean time the steamer Euphrates descended the river with one engine, and by the 9th of November was alongside the Hugh Lyndsay at Basrah, endeavouring to repair the cross-head. This was so successfully accomplished, that the navigation of the

* Montéfik; k is pronounced as ch or j by these Arabs. See Niebuhr.

† 'Akra.

Kárún, previously impeded by the state of the waters, and that of the Tigris, were resolved upon by the commander.

On the 14th of November Colonel Chesney left the Euphrates steamer, which had so long been the scene of his anxieties and his exertions, to go on board the Hugh Lyndsay, on his way to Bombay; and immediately afterwards the former vessel sailed for Mo'ammerah, at the mouth of the Kárún. Here she was detained five days waiting for coal, when she proceeded up the Kárún under charge of Lieutenant Cleaveland. Another party, consisting of Major Estcourt and Messrs. Charlewood, Ainsworth, and Rassam, started in a small boat up that part of the Kárún which was formerly the Haffár canal, and according to the Jihán numá was four parasangas (twelve miles) in length. This would exactly correspond with the actual distance of the channel which now carries off the whole of the waters of the Kárún from the Kárún-el-Ama,* or the blind, its old bed, to the Bahamishir and the Mo'ammerah channel, by both of which outlets it now pours its waters.

The Kárún-el-Ama still contains a small channel of water, which is supplied by the Dórák canal, a derivative from the Jeráhí at Feláliyah or Dórák, the residence of the Sheïkh of Kabán; and by this canal the party proceeded, ascertaining, in the course of their journey, as well as by the examination afterwards of the south bank of the Kárún, that there never were any more ancient beds of that river crossing, at a more easterly point, the great alluvial plain of Kabán and Daúrákistán (Dorghestan).

From Feláliyah the party proceeded to examine a system of canals, by which the Jeráhí is almost drained, six miles to the east of that town. They were found to be seven in number, at a point called Azalik, and several other canals of magnitude also take their departure from the same river higher up its course. At Oreiba, in nearly the same parallel of longitude as Hawáz on the Kárún, an old canal-bed was met with, which appears once to have formed a connexion between the Kárún and the Jeráhí at this point. The canal still contains water in some portions of its bed.

On their arrival at Hawáz, the party were delighted to find the steamer at anchor immediately below the ledges of rock and artificial búnd which cross the Kárún at this point, and which formed at the moment an insuperable obstacle to the further ascent of the steamer. Hawáz appears to correspond to the ancient Aginis, "a village of Susians." It is curious that it and Hawízah† have been confounded together by Rennell and Vincent.

From Hawáz‡ the same party prosecuted their journey up the

* 'Amih, the wanderer?—F. S. † Or Howaïzah.—F. S.

‡ Hawaz and Hawizah are both derivatives from the Arabic Húz, "a body of people," whence Hawizah, the diminutive, a small body or collection.

Kárún in a country boat, starting November 26, passing by Waïs on the 28th, and arriving the same evening at Bendekil (Benhúdel of the Arabs), where the 'Ab-i-Diz, or the river of Diz, unites with the Kárún, while between the two is a large canal called the Shatite.

Here the Arabs asked for tribute, which Major Estcourt did not think it proper to pay; much negotiation ensued, and after a scuffle to get the anchor on board, the boat was allowed to drop down the stream, and returned to Hawáz by mid-day of November 29.

During this excursion decisive intelligence had been received of the existence of a river, designated as the Khábúr, which, flowing past Daniel's Tomb and the ruins of Sús, formerly entered the Kárún at Hawáz, subsequently receded in its bed to near Waïs, and now empties itself into the Dez. At Hawáz, the channel of this antique river, which would correspond with the Eulœus and the Choaspes of ancient authors, was sought for and satisfactorily found.

The steamer left Hawáz the 2nd of December, and navigated the river by the assistance of the charts previously made, arriving at Mo'ammerah on Monday the 5th, and on the next day another descent of the Bahamshir was commenced, and carried to a greater extent in an open boat. The Kárún el Ama was visited upon this occasion, at no great distance from its embouchure; and on the 8th the steamer passed by Mo'ammerah, sailing out into the Shatel 'Aráb to Basrah.

On the 12th of December the Euphrates left Basrah for the contemplated ascent of the Tigris, arriving on the same day at Kórnah. The 14th, while proceeding up the river, one of the boats laden with coal, which had been sent on in advance, was overtaken, having been detained by an Arab Sheïkh for tribute, in defiance of the arrangement made with the Turkish government and the Sheïkh of Montefik. The boat was taken in tow; and in a short time afterwards a second was met with in the same predicament, and the steamer, to the infinite astonishment of the Arabs, now proceeded up the river with two large boats in tow, without her speed being apparently affected.

At Kút 'Amarah one of the vessels was unladen. Christmas was spent between the sites of Seleucia and Ctesiphon, where some new bearings were taken, and some researches made; and on Monday the 26th the vessel arrived at Baghdád, without accident or any extraordinary detention.

Every preparation was now made for the ascent of the river above this celebrated city; and although the waters had not yet begun to rise, it was determined upon starting as soon as possible, and to await the rising in our progress upwards. Accordingly,

on the 2nd of January, 1837, the bridge of boats having been unmoored, the steamer, with several visitors on board, sailed by the Páshá's palace, and along date groves and gardens to Kazmen, and from thence to *Sheri'at-el-Beïthá*, the supposed site of Sitace, not far beyond which she was brought to in shoal water.*

The next day (Tuesday, Jan. 3,) it blew a gale of considerable force. The whole atmosphere was loaded with dust and the sky obscured. This state of things accompanied us during a navigation of upwards of twenty miles. At length, when the steamer was in shoal water, and consequently did not steer well, she was hustled against a bank, and after some efforts to bring her off, during which the upper ring by which the rudder is suspended to the rudder-post was broke, she was got into a channel of narrow dimensions immediately above the village of Dokhaleh.

Under these circumstances, as it would have been impossible to have steered the vessel thus disabled, in shallow water, an immediate return to Baghdád was necessary, in order to get the injury repaired, and at the same time the rudder lengthened a little, by which it was hoped to gain a greater command over the vessel.

The waters continued in nearly the same state, rising for a few days, then falling as rapidly. The seamen, more especially those obtained from the cruizers in the gulf, subjected to no restraint or martial laws, which unfortunately had not been granted to the expedition, gave much trouble and uneasiness; and at length Major Estcourt, having determined upon sending one or more of the most turbulent down the river to their ships, took the opportunity of returning the other men that had been lent to the expedition. The period when the enterprise, according to the last orders of her Majesty's Government, was to break up, was fast approaching, and under the circumstances of the length of time necessary for the repair of the rudder, and the little prospect of his being able to accomplish anything satisfactory by a hurried second ascent, Major Estcourt made his preparation for departure by a caravan; and although, at the last moment, authority came from the government of Bombay to continue the expedition, Major Estcourt persevered in following the orders received from the Home Department.

Accordingly, on the 23rd of January, the party started on camels for Damascus, which they reached on the 14th of February, not however without their adventures in crossing the desert. Not far from El Kaïm some few horsemen, who were observed on the tops of the rising ground before them, kept increasing in numbers, and showed themselves at many points. The party accordingly kept ready, and proceeded on foot. They had not gone far when a flag was seen hoisted to a spear-head, on the crest of a hill in

their rear, and immediately a party came galloping down towards them in that direction, besides many more from the hills all round. Their advance, however, was stopped by a few shots from some of the cameliers. The horsemen then manœuvred round them, inclosing them within a circle, at a distance of about a hundred yards. A fight was on the point of commencing, when one of the Páshá's soldiers (for they turned out to be Ibráhím Páshá's irregular cavalry) dismounted, upon seeing that they were Europeans, and affairs were quieted. Another attempt was made upon the party near Palmyra, by a dozen Arabs on horseback; but they were not numerous enough to venture an attack. The party finally reached Bairút the 25th of February, and Malta March 10, 1837.

At Baghdád the steamer had been put under charge of Mr. Hector, and in pursuance to the instructions left by Colonel Chesney, Mr. Ainsworth, accompanied by Mr. Rassam, started upon an exploratory journey to those neighbouring countries from which indications of coal had been received, or which, by their geological structure, offered the best promises for that mineral.

In this expedition the *Adhaym**, the Physcus† of Xenophon, was visited; the naphtha springs of Dúz Khurmah, and the bituminous pits of Kerkúk; also the *Abú Geger*, or flaming fountains, in the same neighbourhood. A section of the tertiary strata of Kurdistan was then obtained by a line carried to the heart of the mountains from Kerkúk to beyond Suleïmániyah. The same mountain districts were then explored in a direction little visited by Europeans, by the colossal *Godrún* and the head of the little Záb to *Kouy Sanják*. In this excursion an extended formation of highly carbonaceous marl was met with, accompanied by coarse sandstone, containing ostracites and serpulites in cylindrical bundles, which when fractured, presented the interior cavities of the serpulæ, filled with minute pyramidal crystals of quartz. The carbonaceous measures were characterized by only one genus, which was apparently a fresh-water shell (Cyrena).

These deposits attained their maximum of development to the north of Kouy Sanják, where in the valley of Hammám Muk they occupy the base and the acclivities of the hills to a depth of 500 feet, and are capped by coarse tertiary sandstone and limestone.

Proceeding out of Kurdistán by the derbend or pass of *Bomáspán*, the party journeyed by Erbil, Eskí Kelek and Karmalis to Mósul. From this latter place exploratory excursions were made to Nimrúd, the Larissa of Xenophon, to *Yarumjé* (Mespila) to Nineveh, and the sulphur-mines near Hammám 'Alí.

* Odornet, D'Anville Géogr. Ancienne, ii. 149.
† Torra or Tornadotus of Pliny.

From Mósul, having in view to penetrate the Nestorian country, they travelled by the district of the Syro-Chaldeans of Tel Kaïf and Tel Eskof, to the Yezídí Kurds of *Deleïb,* and by the pass of *Turkashá* to Zákhó. In the mountain districts north of this island town they first met the Nestorians, a poverty-stricken but hospitable race, congregated in little communities around half-ruinous and dungeon-like churches of great antiquity.

Unfortunately, at this very moment some Kurdish tribes inhabiting the central range of mountains, were in open rebellion; and after passing the Jebel Júdí and Jezírah, the party pushed on by the road to Séert, but were ultimately obliged to return to the former place, where, crossing the river, they journeyed by *Zergín* and *Tel Sachin* to Nisíbín in Sinjár; from thence visiting Dárá and Márdín, and progressing by the mountain districts to Dyar Bek'r. While travelling in these countries they also took the opportunity of visiting all Christian monasteries, in order to examine, and, when possible, to collect ancient manuscripts.

Háfiz Páshá, commanding the Turkish army in Asia Minor, anxious for the success of the mining operations which are going on around him, wished to detain our party in these countries, and employ them in an active remodelling of the present antiquated system of labours. Their duty called them for the time, however, to other objects, and, accompanied by an officer of the Páshá's, they went to examine the district of Arghanah, from whence specimens of good coal had been transmitted to the expedition by Mr. Brant, her Majesty's Consul at Erz-Rúm. Indications of this coal formation were met with in different places, but what was found was everywhere in contact with dykes of diallage rock, which had acted like basalt, and expelled, almost totally, the bitumen from the neighbouring beds.

The copper-mines of Ma'den Kapur were next examined, and the party proceeded by Cunk and Khárpút (Arsamosata*) to Kebán-ma'den, where the mines of argentiferous galena, occurring at the junction of granite with schistose rocks were explored; from thence by 'Arab-kír or 'Arab-gól to Divrigí, where there is a fine formation of magnetic iron-ore, at present turned to little or no account. From this point the journey was continued by Sívás to Tókát, where the copper is refined; and by Amásiyah to 'Osmánjik, Bolí, and Scútari, so that they arrived at Constantinople on May the 21st. During the whole of this journey the route was laid down by time and by bearings taken either with Schmalcalder's or with a common compass. The elevation of the crest of the various chains of mountains was ascertained by

* Shimshát, S.W. of Khárpút (Rennell).

barometrical observations carefully made, and the dip and succession of strata were as carefully noted as could be done in such an exploratory journey, with a view to preserving a section of these interesting mountain districts.

Nearly at the same time as the latter part of this journey was performed, Colonel Chesney accomplished his last arduous and dangerous task of taking a mail from the Persian Gulf by Zobeïr across the great desert to Baïrút, which he did unaccompanied by any European.

II.—*Latest Intelligence from* CAPTAIN ALEXANDER.

THE following extracts will give the latest intelligence received by the Geographical Society from Captain Alexander, who, it may be recollected, left Cape Town in September, 1836, on a visit to the Dámaras, on the western side of South Africa.

"Clan William, 27th September, 1836.

"I left Cape Town on the 10th September, and the first week we had many difficulties to contend against, but they afforded us excellent lessons: the waggon was very heavy; much rain fell, and the roads were full of mud holes: in Zwaartland we remained two nights in one hole, stuck fast. I had an order from his Excellency the Governor to demand assistance from the field cornets, and by this means was enabled to hire an extra waggon. After many accidents and delays with swollen rivers, &c., we crossed the Berg River, and since that have got on smoothly. Besides the party I formerly described (three white attendants and three coloured), the driver of the waggon added to our strength his wife, who proves very useful as a cook; and Mr. Cook, the Wesleyan missionary, lately arrived in Cape Town from the Warm Bath, very kindly gave me as a guide Jantjies, a great Namaqua, related to the chief Abraham, of the Bundlezwaart tribe, under whose protection we shall first be.

'I have visited the Cedar Mount in this neighbourhood, and am about to inspect a bushman's cave with rude drawings in it. I also intend to see the mouths of the Oliphant and Orange Rivers, and one or two undescribed bays on this side the Orange River mouth, as the proper season for leaving the Warm Bath is January and February, and I have some time to spare."

"Lily Fountain, Kamies or Lion Mountain,
12th November, 1836.

"My last communication was from Clan William, and I now beg to give a summary of my proceedings subsequent to leaving that place.

"I went first to the Rhenish Missionary Institution of Ebenezer, on the south bank of the Oliphant River, and about twenty miles from its mouth. The institution is yet in its infancy, and has 108 Hottentots on the books. On an average the river overflows once in three or four years, (though it has not done so for the last three,) and then the return

of corn is one hundred fold! The missionaries propose, as soon as they can, to lead out the water.

"Having swam my waggon across the river, and carried over the goods in it in a boat, I left my people to proceed northwards, and galloped down to the mouth of the river to inspect it. I found that it divided itself into two branches, enclosing an island, before entering the sea, and that there were many rocks at the mouth, but that with some expense, and by making a cut, ships might enter the river.

"The rise of tide is sometimes three feet, but often six: the soundings in my sketch map are at low water. I saw a farmer from near Clan William fishing at the mouth of the river with a boat and seine—he caught 'hurders' and 'springers.'

"At the Heer Lodgement, on my way to the river, under an overhanging rock where were many names, I saw carved

F. VAILANT, 1783.

Passing through a barren and uninteresting country covered with shrubby plants, and the water brackish, I reached the Green River, on the banks of which I found a boor in a circular house of mats with his family, on his winter grazing ground; for four months in the year, July, August, September, and October, the boors in this part of the colony are in the field. Near the Green River some of my people were severely stung in attacking a nest of rock bees. One of them was put to flight by a snake with a very large head.

"On the 10th of October we ascended the Kamies Mountain, and reached this place. The houses of this missionary institution are delightfully situated on a plain between the peaks of the Great Mountain: the highest summit is 5000 feet above the level of the South Atlantic, which is seen at the distance of sixty or seventy miles. There are 800 Namaquas on the books of this excellent Wesleyan establishment, and I was quite surprised with the quantity of ground under cultivation in the mountain valleys. A muid is 200 lbs., and 1500 muids are usually raised by the people, 100 muids being commonly sown. Mr. Edwards, then absent at Cape Town, has charge of the institution, which was founded in 1816.

"I now despatched a trusty Namaqua with presents and a message to the chiefs Abram of the Bondlezwaart Namaquas, Warm Bath, and Whitboy of the Bastards of Pella, to announce that I was coming, and to ask if either of them would be willing to accompany me through their country and into the interior.

"Having time to spare before the rains of January (which fall on the north side of the Great River, and render the country then fit to be traversed) I remained a fortnight, alone, on the Kamies Mountain, wandering about its summits, collecting plants, preserving bird skins, &c.; and not expecting the messenger's return till the beginning of November, I left my people and set out on horseback to learn the truth of a rumour I had heard of the existence of an excellent bay W.S.W. of this, and then, in compliance with the wish of his Excellency the Governor, to visit the mouth of the Orange River.

"Having descended the mountain, on my way to the coast, I fell in with a merchant captain, Mr. Anderson, who had just been to the bay

before mentioned: he gave me the soundings, which he had taken with a boat, and a slight sketch of the bay.

"The depth and breadth of the bay is not, apparently, much short of a mile: it is sheltered from the prevailing winds (S.E. and N.W.), which blow across the entrance. There is only one danger, viz. a rock, near the entrance. Good anchorage, with sand and shells, in six fathoms in the middle of the bay. High water, at full and change, at four A. M.; and two excellent sandy beaches, for hauling the seine. If made available, this bay will be of the greatest use to this part of the colony, which at present *has no market or outlet for produce.*

"We make out Rove Wall Bay to be forty miles south of the Zwaartlinjies River. As the admiral on the station (Sir Patrick Campbell) has kindly promised to send up a ship of war to look after the expedition in March or April, I have requested that she may call at Rove Wall, on her way to Walwich Bay, &c.; so that a better account may be given of it than the above sketch.

"I was two days at the London Mission station of Comaggas, between the Kousie and Zwaartlinjies rivers, and a short distance from the sea, and then set out in a horse waggon for the Orange river.

"I found the bed of the Kousie (the boundary) dry; only two good fountains in four stages between the Kousie and Orange rivers: the country very mountainous and hilly, the plains sandy, and everywhere covered with low bushes and shrubby plants;* 800 Namaquas and some Bastards live scattered between Comaggas and the Orange under the care of the worthy old German missionary, Mr. Schmelen, by whom and by two Rhenish missionaries, looking out for a new station, I was accompanied.

"We arrived at Aris, twenty miles from the mouth of the Orange. Here, under the trees of the river, we found a small Namaqua kraal of mat huts; the men in karosses, or skin mantles, and trousers; the women in karosses and petticoats. They had flocks and herds, but no gardens. A great part of the year these people (when together they are about 300 in the tribe) live on dried seals' flesh. Of Seal island I had not before heard: it is about half-way between the Orange and Kousie rivers: 400 seals are killed there on an average, in November, the breeding season. A trader, Archer, has bought the skins from the people lately for two or three rix-dollars; they sell at the Cape for twelve rix-dollars, and, I believe, in England for three guineas.

"The Orange was now (on the 31st of October) 450 yards across, at Aris, and I waded over to Great Namaqua Land. We then went through heavy sand to the mouth of the Orange river.

"Three miles from the mouth, I found a wooden landmark, on which the name of De Graaff was carved; he was landrost of Tulbagh in 1809. The Orange river has long been desired as the boundary of the colony; and half a dozen farmers pay taxes, though living beyond the Kousie. I found great flocks of wild geese, wild ducks, teal, flamingoes, sand-larks, gulls, Namaqua partridges, &c., at the mouth of the river.

* There were flocks of ostriches and many steinboks in the plains.—Zebras are also frequently seen.

" The main current of the river is on the north side. Drift-wood in great quantities (carried down by the flood after the beginning of the year) lay far from the water everywhere. There is good grazing west of the Beacon. I found the mouth apparently deep enough for a schooner to enter: no rocks or dangers of any kind. Two spits of sand enclosed the entrance, which seemed about 170 yards across. Inside was a lake about four miles across.

" I inquired of the Hottentot guide if he knew of any bays about the mouth of the river; and he said he could take me to one. We accordingly rode south about two miles, and found a good bay (500 yards by 250) for small craft; and a good beach at the bottom of it, for hauling the seine. The Hottentot also reported the existence of other sheltered places in the direction of the Twin Mountain.

" We returned to Aris; after which, I think I made rather an important discovery. I was asking everywhere for ores, as there is a rumour of the Orange flowing over golden sands, and I thought it likely that, in this otherwise unproductive country, great mineral treasures might be found. We have long known that there was copper on the west coast, but so far inland, and at such a distance from water carriage, as to be of no use. The Society will, perhaps, be gratified to learn, that by means of a Bastard* I have found out the position of a very rich mass of copper ore (specimens of which, now in my possession, shall be forwarded by an early opportunity) close to the Orange river. In longitude 17°, and twenty miles south of the river, is where the copper is found in great abundance on the surface of the ground, and other ores *may* also be not far off.

" A waggon road could be made to descend from the copper along the beds of two dry rivulets, as marked in the sketch. On the river is abundance of excellent black ebony, black bass and doorn (*mimosa*, both used in tanning), willow, and other trees of considerable size, which might be employed in smelting the copper, or the pounded ore could be carried to the mouth, at almost all times of the year, in flat-bottomed boats. Saw-mills would do well on the Great River, and there is plenty of shell lime along the coast, immense beds of muscles, &c. Suppose ' an Orange River Wood and Mining Company' was established, the natives and speculators might both be benefited.

" In returning to the colony we were three days without milk, bread, sugar, or salt: and at a halt in the dry bed of the Kousie, the thermometer was 103°, with a hot north wind, on the 6th of November, and we scooped out holes in the sand with our hands, to get at fetid and brackish water.

" I arrived here on the 8th, and found Mr. Edwards returned from Cape Town: from him I have received every civility and assistance. I also found the Namaqua chief, *Abram*, waiting for me: he is very well disposed, will accompany me through his country, and has gone on before to assist me through the Great River. His Excellency ordered twelve boors to conduct me to the river, to produce a good effect on the natives, and we leave this on the 16th; I hope to reach the Warm Bath on the 26th of November.

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* The leader, in 1792, of Van Reenen's waggon, whose journal I translated and sent to the Royal Geographical Society lately.

"I shall lose no time in getting out by Walwich Bay, or will steer eastward as I see the way open. There is a vast deal to describe beyond the Orange, and I shall take every means to collect as much as I possibly can." * *

"Nabees (Warm Bath), Great Namaqua Land,
January 1, 1837.

"After the despatch of my last letter from the Kamiesberg, in which I mention the discovery of a new bay forty miles south of the Zwaartlinjies river, of a seal island between the Orange and Kousie rivers, of a very rich mass of copper near the Orange river, in longitude 17°, and my visit to the mouth of the Orange, I left the Kamies Mountain on the 16th of November, escorted, by his Excellency the Governor's order, by a field cornet and twelve mounted boors; not that we feared any danger in coming to this place, but to show the Namaquas that the expedition was a Government one. We had likewise an extra waggon; and what, with fifty bullocks, fifty horses, and fifty sheep, we had a good-sized caravan. Guns have now become plenty in Namaqua Land. We cannot depend on game for support, so I was forced to buy a flock of sheep for my people.

"Of all the countries I ever saw, that between the delightful mountain of Kamies and the Orange river is the most barren—I hardly except Arabia. We traversed stony and grey plains, with low shrubby plants scattered over them, and rocky and bare hills on which were seen only an occasional cocker-broom, of which the bushmen make their quivers. This region seemed accursed. I was forced to buy another horse from a Dutchman, for one of my Cape chargers was totally unable to walk from sheer starvation; the other got sooner into the way of eating bushes. Grass there was none, though after rain scattered tufts are here and there found.

"In a week, without a halt, we arrived safe and well at the Orange river, all except my poor horse. Our route was by Silver Fountain, Byzondermeid, Henkries, &c. At Byzondermeid I found an old missionary of the London Society, Mr. Wimmer, aged 74, living in a reed hut, and surrounded with half a dozen other huts containing nomadic Namaquas. Mr. Wimmer had not tasted bread for a whole year, or salt for six months; he regaled me on dried beef and some bush tea. His wife, a Hottentot woman of forty, had a child at the breast.

"At the Orange river, near the mouth of the Giep of the map, but 'Hoom (with an initial click) of the Namaquas, we found the chief Abram, of the Bondlezwaart tribe ready to assist us across, with sixteen of his best swimmers. Mr. Jackson, a Wesleyan missionary, also accompanied him. Abram throughout has behaved exceedingly well; first in coming to see me at Kamiesberg from the Warm Baths, and again in going before to assist us across the dangerous Orange. Fortunately the river was only half full: we crossed without difficulty, and it rose immediately after with rains in the Bushman's Land beyond Pella.

"Steering north-east, we arrived here in three days, about 450 miles from Cape Town.

"I dismissed the boors, who had never seen the Great Orange before, and were constantly dreaming of bushmen, lions, and devils. They

have reason to fear in Namaqua Land, for there are many of their late slaves in it, who had left them from bad usage, and who would not at all scruple to shoot their former severe taskmasters.

"The kraal of the chief Abram is in the midst of a great plain, with conical hills of 100 or 200 feet elevation rising here and there in it. The huts, of matting, are on both sides of the 'Hoom river, in whose dry bed (filled with water only two or three times a year) are dubbee boom, mimosa trees, &c. The huts number sixty, and each may contain ten souls. The men wear karosses, or mantles of sheep-skin, or leather jackets and trowsers, with a hat or handkerchief on their heads: the women are all in karosses, skin aprons long behind and short in front, and ornamented with a long fringe nearly touching the ground.

"There are lions, steinboks, ostriches, zebras, jackals, &c., all about us. The chief shot a lion within half a mile of where I now write, and presented me with the skin. I have employed my people, whilst we are waiting for the thunder rains of this month, to make the grass grow, in training my oxen for the pack-saddle, in preparing birds' skins, and in putting our equipments in order for our progress northward.*

"To-day I returned from a week's excursion to Africaners' kraal, sixty miles east of this, going and returning by different roads, as the Africaners and Bondlezwaarts had a fight there some time ago, in which they lost three or four men each side.

"The chief Whitboy of Pella has behaved strangely to me. I sent him two messages; and he neither sends answers nor comes himself. He was recommended to me as the best companion I could have on my journey towards Walwich Bay. But Abram goes three weeks to the north with me, and then we may get Wilhelm, or Amral, to go farther; if not, my own men profess their entire willingness to go anywhere I choose.

"The people of Abram are unwilling, of course, to go among the Damaras with me, for I see many Damara cattle among them. But this plundering of the Damaras must be put an end to, if possible, by our opening a trade with them at Walwich Bay, and offering them protection against their southern enemies. Great store of ivory, of hides, horns, gum, wax, &c. is to be obtained from the Damaras.

"I hear strange tales of mountains north of this, composed entirely of iron; of giants, with feet as broad as elephants', and who are strong enough to carry off an ostrich on their shoulders; of two-legged serpents of great size, which pursue women, and kill half a dozen cameleopards at once; of wild horses living in the hills of the interior, with one horn on their foreheads, &c. Doubtless, if, by the Divine favour, we are spared, we shall see much, though not a phœnix or such wonders as the above.

"Since I engaged Robert Ripp, the sailor I formerly mentioned, who had lived for years among the Namaquas, I hired an interpreter, Abram, a smart young Namaqua, who understands Dutch (which I

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* The warm spring, which I cleared out with my people, is usually 103°; the stream from it six inches broad by one and a half deep. The Namaqua men constantly bathe in it.

studied in the colony). I have now, therefore, got four Europeans and four coloured men with me. To two of the Europeans I give 3*l.* a month each: to the soldier double pay."

"Banks of the Kaamop, three days east of the Great Fish River, and about 170 miles north of the Warm Bath, Great Namaqua Land. Feb. 18, 1837.

"I had the pleasure of writing to you about a month ago, before I left the Warm Bath, and now having, unexpectedly, an opportunity of sending letters to the Cape, by three Namaquas who brought me here merchandize, (shirts, cotton handkerchiefs, brass wire, and buttons) of which I stood in need, I beg to give you a short account of my proceedings during my journey so far in the direction of Walwich Bay, &c.

"I left the Bath on the 18th of January, having waited in vain till then for rain, and for the above-mentioned goods. Fortunately, immediately after I left the Bath I had abundance of thunder rain. I have had no want of water or grass on my way hitherward. I hear also, that since I left the Bath no rain has fallen there; so it was as well that I risked leaving that place.

"The Captain of the Bundlezwaart Namaquas (Abram) accompanied me with sixteen armed men on pack oxen. On the second day I was joined by the petty chief Daniel, and three men; which last chief I had engaged to accompany me all the way to Walwich Bay, under the promise of supplying him with powder and lead to shoot elephants on his way back. I also agreed to try to obtain for him, by negociation, the property of which he had been robbed by Henrick, a petty chief of Abram's, lying fifty miles out of our road.

"With my waggon and pack oxen I travelled up the 'Hoom (the river which runs past the Bath), nearly north, for six days; and leaving the waggon on its banks with a guard of twelve men, I set out with two white men, the two chiefs, and eleven Namaquas, for the kraal of the robber Henrick. We travelled fifty miles, N.N.E., with horses and oxen, and got among the 'Caras, or rugged Mountains—a range of various heights, from 300 feet to about 2000, flat topped, and composed of clink stone, principally arranged in horizontal strata.

"Springboks in large flocks were seen, many ostriches and zebras, a camelcopard, and the *spoor* of a lion. The weather was very hot, both day and night—95° at mid-day, commonly, and 80° at sunrise.

"We found Henrick in a rocky glen, very difficult of access. He refused, to his own chief, to deliver up Daniel's property, which he had seized (viz., thirty cows and forty goats), because a year before, on a hunting party, Daniel's *brother-in-law* had *accidentally* shot Henrick's father. Henrick also prepared his people before us, to the number of thirty-three, armed with guns, to take Daniel's life, because he could not get that of his brother-in-law. We defied Henrick to take Daniel from us, or to kill him. Kept strict watch all night, and brought off Daniel in safety next day. Henrick would not listen to the proposal I made him, of receiving a fine for the life of his father: he and his mother both cried—'Blood for blood!'

"We rejoined the waggon, and I let Abram leave us, with his people, that he might force Henrick to restore Daniel's property, and thus pre-

vent war in the land, for Daniel threatens to raise a commando of the people of Amral and the Africaners, and to go against Henrick.

"After travelling a degree farther north, I arrived at the Kaap River, a branch of the Great Fish: there we saw a good deal of honey-beer drinking and dancing. We stayed for some days at Daniel's kraal; and, having been assisted with eight pair of oxen, came on here, to a kraal of the Great Captain's, William Zwaartboy (the Namaquas adopt Dutch names—*i. e.*, those of any note). Here we have been staying to fortify ourselves with an *abattis* of bushes round the tent and waggon, for we hear that Henrick has come with a commando against Daniel's kraal again, fifty miles south of us, and that he is likely to attack us too; but we are quite ready for him: however, if Zwaartboy comes first from the Fish River to see us, there will probably be no fight.

"Before the rain, on the 16th, the heat was 110°, now it is 80°, and the river is running briskly. I have fallen in with a man here, who was at Walwich Bay three years ago, and he says that our route will probaby be to Zwaartmorass, one day and a half; to the Fish River, one day and a half; up it, six days; to Buffels Poort (through a field abounding with lions, cameleopards, rhinoceroses, bucks, &c.), ten days; to the Kooisip, three days; to the Bay, eight days—beyond that on the Squakop (Somerset?), the Damaras abound.

"The other day I bought a young Damara negro (a boy), ten years old, for about 4*s*.—that is, for two cotton handkerchiefs and two strings of glass beads. His mistress was a Namaqua woman. The boy was half starved, and he is now well fed and clothed, and is my shepherd.

"We see many Damara slaves among the Namaquas. My medicine chest is in great request;—we have the usual annoyances of heat, dust—and very stony roads, if roads they may be called, where no waggon ever passed before—disputes to settle, bargaining for horses, sheep and cattle, &c.; but we manage to keep a good heart, and though they sometimes try to frighten us, we will go as far as we possibly can —human nature can do no more."

III.—*Journal of an Expedition up the River Cuyuny, in British Guayana, in March,* 1837. By William Hilhouse, Esq., Corr. Mem. R. G. S.

Having long laboured under the most distressing biliary symptoms, which had reduced me to a state of great debility, I resolved this month to try what the air of the mountains would do towards the restoration of my health. This Journal may, therefore, be termed the Diary of an Invalid, as I made no observations, took no instruments but a watch and Schmalcalder's compass, and divested myself of every scientific pretension but the collection of such granitic orchideæ as might fall in my way. I reached the Calicoon Creek in Massaroony River on the 1st March, and had to return to George Town for craft and supplies, as

I found, notwithstanding the establishment of a Protestant Mission at Bartika—the whole of the population literally without bread, and it was necessary to proceed loaded with rice—a dilemma to which I had never been before reduced. My illness had now assumed the decided character of dysentery, with which, however, I started on Tuesday, having only two hands and a woman, and, at Timmerman's, about two hours up the Cuyuny, engaged five others. On starting next day, I found that Timmerman had stowed away two women and two children, in addition to my already overloaded craft, and I must either take them or stay. I had no resource, so submitted. My crew now consisted of seven men, three women, two children, myself, and boy—the former all Caribisce, and I caution all future travellers against such a similar one. The Caribisce are, at the best, proud, sulky, and unsteady workmen, but these were half-starved and weakly.

"*March* 16*th*, 1837.—Started at nine; course W. by N. At ten, the first *Acäyu* Rapid or Fall. At eleven, at *Saregutaava*, the second Fall, and a Portage. At twelve, *Twarúng*. At one, *Ematúbbah*, called below the Great Fall. At three, *Arcaboosa*. At six, *Camareea*, and slept. The dryness of this detail must be very uninteresting; but it is absolutely necessary to give some idea of the course of the river. The epithet Ematúbbah signifies a Portage, or Fall, that cannot be passed without unloading and hauling up the craft over the rocks. There are two in this river, one in Corentyn, and one in Barema. I had this day the assistance of a free man and a labourer, to my great relief, as the Caribisce were weak from hunger, and had little idea of facing a fall in so large a craft as mine. We ascended this day fully seventy-seven feet—a day's work which, I conceive, at the outset to have deterred former explorers, for I find, to my great surprise, that from this to the eighteenth day's journey, is a virgin river, as to its ascent, though I am aware that refugees from the Spanish missions have descended it—a Mr. or Dr. Bruton I recollect as one.

"At Camareea I found four or five of the Orchideæ, common in Hobabba Creek, twelve miles from Georgetown.

"17*th*.—Dried the cargo wetted in the fall, and started at 11. Course W. by N. *Wókah* or the Powis Mountain right a-head. At 1¼—Wókah Creek on the south shore—*Oerabisce* Creek on the north shore at 4½; having crossed to the north bank, slept at the foot of the *Suwaraima* Fall. We made this détour to the right to avoid the *second* Ematúbbah, by a string of rapids in another channel—one hour's course, N. by W. from this. At the foot of Suwaraima I formed some conception of the rapidity with which a Pacou swims. One was in a basin with two apertures—the lower one too small for it to escape by; the upper, a stream rushing down nearly three feet perpendicular, barely broader than the fish. I bestrode this, and whilst calling for an arrow, the fish sprung up the opening, and was 50 feet up the stream in less than half a second. Its flight was barely visible.

"18*th*.—Started at 8; Falls very difficult, about 30 feet, but in ledges; veered again southward, and slept at 4 at the *Acareewa* Fall—fine Pacou shooting at this Fall.

"19*th*.—Started at 7½; at 12 reached the *Tonomah;* and at ¼

before 5 the *Payuca*, and slept there: passed numerous small rapids this day, and had much sport with the fish.

"5*th Day.*—Left Payuca at 8. Heavy rain in the night—Scotch mist in the morning—a few rapids above, after which a large opening. Oars and sails—course W. by N. From Camareea to Payonea is a semicircle, by which two large falls, in the direct course, are avoided, and one large, and several small falls and rapids are substituted for them. I assumed the direction of all the ascents, as I found the Indians little acquainted with the power of purchases, and experience had taught me how little they were to be depended on with anything but one of their own bark canoes, or wood-skins, which two men can carry on their heads with great ease. Former excursions had made me at home in the falls, and the Indians, after seeing the ease with which they surmounted difficulties that appeared impracticable, under my direction, assumed courage, and faced the falls nobly, whilst I was at the bow of the craft. If I left it, everything stood still; and if I took a ramble on the rocks in search of plants, I was sure, on my return, to find the corial *in statu quo*, and the crew gorging themselves with anything at hand in the eating way. All Indians are gluttons; but the Caribisce will outeat all the tribes. I must observe that though mechanical knowledge is of great assistance in *ascending*, it is quite useless in *descending* the falls. Then the quick eye, dexterous hand, and unshaken nerve of the Indian are inimitable by any exertion of European science—he who interferes with them in *shooting* a fall does it to his own destruction.—*Payuca* is 200 feet above the level, and 47 miles *west* from our departure. Several blocks of stone were found here of a bluish tinge, and so fine a grain, that we sharpened our cutlasses, axes, knives, &c. upon it; but so excessively hard, that it gave out sparks on the slightest blow with iron. Halted and slept on an island opposite the *Saramu* Creek on the north shore. Here the path sets off to Pomeroon and Wayeena rivers, and is the same that was traversed by Gullifer and Smith in 1820. It is computed at five days' journey to the Wayeena by the Indians, equal to seven or eight of an European.

"6*th.*—Started at 8, with a Lowlow of 50lbs.; course W. by N.; still water. At 9, *Wagrara* rapid; at 2, *Watoopegay* rapid; small, but very long; *Tolowou* Creek, N. bank, at 9½. We spoke this day two woodskins loaded with turtle for the coast, and bought three days' cassada. Oars half the day; slept at *Watoopegay* at 3.

"7*th.*—Started at ½7. Course S. by W.; dense fog. At 9, Copang Creek, N. bank. At ½10, Bayuma Creek, S. bank. Here the river clear of islands, and 150 yards across. At 2½, *Waycourny* Fall; long and difficult; rocks like the slag of a glass house. Half this day course W., oars and sails, and a good breeze aft.

"8th.—Started at 7; course W. by S.; clear of islands; halted at half-past 9 at the foot of the Fall *Acueywaugh*, where we unloaded for the sixth time, and halted for the day and night to fish, hunt, and dry cargo. The water is here quite black and transparent—hitherto it has been alternately dark and clear—and white and muddy—as it passed through rocky or clayey banks; so that the epithet of a *white* river to the Cuyuny is inapplicable—from this point upwards all being a dark

water. I reckon this fall 124 miles W. of our departure, and 220 feet above the level of the sea.

"*9th.*—Started at 7h. 45m.; course W. by N. At 9h. 10 m. *Toropaaru* Creek, from which is the communication with the Punoony Creek in the Massaroony—Smith and Gullifer's route in 1820. At 10, N. by W.; at 11, N. by E.; at 12, Acha rapid. At 1, course N. by W.; at 3h. 20m. W. by N.; at 3½, Maya Creek, N. shore; 3h. 45m. course N.; 4¼, course W. by N. 5 o'clock, halted for the night at lower *Arapeera.*

"*10th.*—Started at 8¼; course W. River spotted with rocks; 250 yards broad; very shallow; here and there islands, and full of small rapids. At 11h. 10m. *Tocro* Island, where a white man, most likely a smuggler, is reported to have resided some years here. Halted at *Waseema* Island at 4.

"*11th.*—Started from Waseema at 7½; course W. by N.; caught in the night two large Parwareema and a very large Pyara. At 10, *Goomeyrey* Fall rapids—again unloaded—heavy rapids from hence to WOHMUYPONGH—or, the "Canoe Wrecker," which is the highest fall in the river, 30 feet, where we unloaded and transported the corial with great difficulty over a portage 300 yards across. I reckon the head of this fall 300 feet above the level, and 176 miles W. distant from our departure. I must here premise, that most of the large falls in this river are preceded and followed by a string of rapids, which are all included by the Indians in the appellation of the Great Fall to which they are attached—they jointly are of greater altitude often than the fall itself, as in the present instance, where, though I allow only 30 feet for the Great Fall, its rapids make at least 50 feet more—in all 80 feet. The channel of the river from Goomeyrey lies through black granite with detached upright masses with round tops, on which grow stunted bushes, and in many instances an Oncidium, which is the only orchideous plant that I have found exclusively attached to the granitic region. Our stages from this point present little variety, being for the most part through still water.

"*13th.*—Started at 6; course W.; at 8, N.W.; at 11, *Otomungh* Fall; at 4, *Wataweiyka*—sails and oars.

"*14th.*—Started at 6, course W.; 6½, course N. W., *Kanaima* hills a-head—8h. 10m. S. W.—8h. 20m. S. by W. At 9, the Accaway settlement of *Lorenzo*, being the first habitation we have seen since starting at the foot of the Kanaima Fall. Finding here no bread, we left at 12; at 2¼ had passed the island of Upper *Arapeera*, which, with the neighbouring islands, was full of Quassia Amara, being almost the only underwood: caught three very fine Silures this night, viz., a lowlow and two marepaghas.

"*15th.*—Started at 6; course W. at 6h. 45m.; open river, quarter of a mile broad—at 9, *Comang* Creek, south bank, course N. W.; at ½10, *Carapeesy* Creek, N. shore, where we halted till 3, being the first Caribisce settlement, which is five miles inland, and procured our first supply of food, viz., cassada, yams, and plantains, of the finest description; started at 3h. 10m., course W.; and 5, slept at the foot of the Macabbah rapids.

"16*th.*—Started at 6; at 7½ passed the rapids, and hoisted sail, course W.; at 9h. 10m. course S. W.; at 9½, *Eyreycooney* Creek, S. bank, where the Spaniards penetrated in the Patriot War; course W. by S.; open river, 150 yards across; at 10h. 11m. course S. by W.: at 11½ course W.; at 1½ course S. W.; at 4 reached *Mauricios*, the second Caribisce settlement, on the south shore, where we slept. It is called *Unawarooa*, from a small creek just above. In this day's progress we had two views of the mountains of *Tippoorah* and *Mowrocara*: the ridges appear to run S. E. and N. W., and their northern faces seem about 2000 feet high, the upper half of which is an angle of 75°, and the lower, or debris, 45°. They differ in this from the mountains of the Massaroony, which are perfectly precipitous on their N. faces, though the rock appears similar, and they are covered with stunted trees to their summit; they terminate at the south bank of the river, nor have I seen any indication of hills worthy the name of mountains on the north side. At this place I found a prismatic cactus, parasitical, with long flower stalks shooting from the base of the new joints. I looked in vain for a duplicate.

"17*th.*—Started at 6h. 15m., course S. W.; at 7h. 15m. course S. by W.; at 8h. 35m. *Coopeyrey* Creek, north shore; at 10, the great Sand of *Maypouriband*, course S. W.; at 11h. 40m. course W. by N.; at 1 reached the Accaway settlement of *Awara-Paaty*, and slept there. River black; sailed all day; level 400 feet; distance 268 miles. We found here a bell from one of the deserted missions, a cooloo, and a red rumped powis, both common in the Wayiena and Barema rivers. The people of this settlement, except two or three women, were all up the river at a piworry feast; we procured, however, fresh bread and a few yams.

"18th.—Started at 6h. 20m., course W. by N.; at 7h. 50m. course S. W.; at 8½ N. W.; at 9 *Cateeya*, Spanish Military Post in the royalist time; at 9½ *Coroowa* Creek, north shore. The water of this creek is as muddy as that of the Demarara at Georgetown; being the lowest direct communication with the Spanish provinces, it was the old route of smugglers, and the company of soldiers at Cateeya were as much for the prevention of smuggling as for the protection of the missions, as it cut off all communication with the lower river, which I find, from the old Indians, was prohibited. I have no doubt that from this point upwards the Spanish have good authorities. But there is every reason to believe that the lower part is yet undelineated, and as I took no observations, must remain so for the present. The course is however undoubtedly W. by N. on the average, and my distances are far from overrated, oars and sails being frequently used, and the descent occupying nearly as much time as the ascent. The Coroowa Creek is also famous, or rather infamous, as being the scene of the cool-blooded murder of the Missionaries of the Caroony, who were hunted down and shot by the ruffians employed on the service with relentless cruelty. All the old inhabitants, both Accaway and Caribisce above this, were converts of these Missions, and they all agree as to the fact of ten Missionaries being shot in their attempt to escape through the Coroowa to Demarara: such is civil war. The creek was dry and stagnant, the communication being only open

during the rains. At 10½ *Amacaynia*, where was a great Accaway dance of about 300 people, this being the second day the piworry was beginning to operate: and when our large square sail, the first seen on these waters, rode right up to the landing, they gave a yell of astonishment, and rushed in a body to the water side to see what it meant. As soon as they found, however, that we were not *Spaniards*, everything in the house was lavished on us, and it was not till my whole crew had imbibed at least a gallon a-head, that I could get them away, scarcely able to breathe from repletion. These dances are the undoubted symptom of reversion to barbarity. But it is a substantial proof, even at this date, of the merits of the Missionaries, that they are spoken of universally with feelings of the most affectionate respect and regret, whilst their persecutors are held in the utmost abhorrence, and every possible epithet of detestation is coupled with the name of *Spaniard;* as an Indian very gravely told me, "We never knew hunger under the Padres, for though we worked for them, our children's mouths were filled with bread and *beef*." Indeed, though I found this country comparatively a Land of Plenty, there is no doubt that animal food is of very precarious supply; and the flocks of cattle in the savannahs, which were regularly killed and served out as rations, made the life of an Indian of the Missions one without care or privation. They endeavour in some measure to supply the loss of beef by raising common fowls, which were plentiful in every settlement, at almost eighteen-pence a couple. From 10½ to 1 our course was S. W., when we halted on the N. shore to fish and hunt, being out of meat, but without success, the dancers having swept the bush of game for miles round for their feast.

"19*th*.—Started at 6½, course S. by W.; at 7½ S. by E.; at 8h. 55m. W. by S.; at 9h. 50m., after half an hour's halt, W., ½ S.; 5m. to 11 W. by S.; 11 S. W.; 11½ W. by S.; at 12 reached the mouth of the *Coora Coora* Creek, the settlement of the Accaway *Provincio*, and pitched the tent on a large sand at the base of the hill, on which his house stands.

"When I found in the course of my progress that health and means were sufficient for a more prolonged excursion than I originally projected, I fixed on this creek as the limit—having heard of the high savannahs at the head, where I expected to botanize advantageously. Though I went a day further up the river, still this creek may be deemed the limit of my excursion, and I made two trips up the creek, and over the falls to the savannah in question. It is situated in the range of two branches of the Ekruyekuh Mountains, between which the Coora Coora Creek runs in a succession of unnavigable rapids for at least 20 miles. I consider the savannah 1500, and the mountains on each side 2500 feet above the sea—and I was beyond measure astonished to find at this elevation the plants, with two or three exceptions, exactly the same as those common to the Demarara sand hills, and the alluvial creeks within the influence of the tides, and a few miles from the sea. The only peculiarity worthy of remark was, that plants below, purely parasitical, were here growing in whole acres on the bare sands, and covering boulders and cliffs of granite, without a particle of soil attached. Brassias, Oncidiums, and the commonest Orchideæ of the creeks below,

were thus situated; but the more choice specimens were either very scarce or wanting. One Oncidium alone I characterise as exclusively granitic, with a long pear-shaped bulb, and a very elegant flower-stem six feet high—much resembling the *Oncidium Altissimum*, with which it is intermingled in large clumps. This, and the Cactus I have before described, are the only botanical novelties I have seen in the granitic region. Greatly to my disappointment, even the forest trees were similar—only that about here, a tree unknown below, with a black heart, called the *Tāow*, superseded the *Mora*—which was till now the undisputed Lord of the Forest.

"After five days' halt, and exploring the creek, and the upper settlements, I therefore returned. The river had fallen fully four feet, and the falls were becoming more and more dangerous—the rains were evidently setting in—and I determined on returning. Little interest can be excited by a description of the difficulties attending my return with a crew reduced by desertion to only four hands. It was infinitely more hazardous than the progress up—but I was prepared for it, and after a descent of fifteen days, I arrived safe at Calicoon, without any material accident.

"The Cuyuny River is by no means so picturesque as the Massaroony. The land is nevertheless superior in quality to that of any other river I have yet explored. Hills of a very fertile red sandy clay, here and there occur—and the Indians cultivate to great advantage. None, however, can compete with the alluvium of the coast. Two crops of ground provisions, and three or four of plantains are the extent of the production—but the crops for these two years are enormous, and they are soon restored. Native cottons I found of the finest quality. The race of Indians are in stature, appearance, and conduct far superior to any I have seen on the coast. This is solely attributable to the labours of the Missionaries, under whom polygamy was forbidden—and those premature sexual connexions common on the coast being also prohibited. The effect is evident in an *improved race*, both morally and physically. Humanity must mourn the extinction of that system of instruction which had gone so far in rescuing these children of the forest from natural vice and its consequences. It must indeed have been a noble system, when its effects, after twenty years of abandonment, are still enduring; for I make no scruple in repeating that the refugee Indians of the Upper Cuyuny *are*, or *were*, the same class as in the Morocco Creek, the most moral, industrious, good-mannered, and trustworthy of any free labourers in the Colony, without respect of country or colour.

"Of a far different description are those who, preferring the rum of the plantations to the fruits of honest industry, have come down the falls and settled in the vicinity of civilization; a total disregard to honour in their dealings, unconquerable indolence, and beastly intemperance. This is the class of people that the Protestant Mission has to convert—and I need not say that the attempt is a hopeless one. I have every wish to see the work of conversion carried on to the utmost; I care not by what sect of Christians, so that they be such. But as an *Indian* Mission, the Bartika one is a total failure. The Indians of the vicinity are much more depraved than they were before the Mission was established.

On my arrival in March, in Massaroony, I saw no fields burning, and what cultivation I saw or heard of was far below the adequate scale. This was not so of old. In February the Indian cut down the bush for his field—in March he burnt the wood on the ground—in April he planted the cassada for the next year's supply. Not merely the Indians but the free people of colour were in the same predicament. Not a cake of cassada bread could be bought for any money on either of the rivers. The Indians and free people in the vicinity of the Protestant Mission were starving—the Indians beyond its reach were revelling in plenty. The fact speaks volumes. I bought in Coora Coora fifty pounds of hard dried cassada bread for a three-bit knife. It cost me six shillings a day to feed my crew with rice from Georgetown to the Carapecsy Creek, and fourpence-halfpenny per diem afterwards with cassada. It would be unfair to infer, that because the beginning has been unfortunate, the end must necessarily be so also. And common report gives the clergyman now in charge of the Mission, a character of great zeal and worthiness. But it is a melancholy prospect for the colony, to see such a result as the present—from freedom, civilization, and religious instruction, after so many years of experimental progress.

"I have added little in this excursion to geographical or botanical science. The Yuruary River and its savannahs were still five days' journey off, when I turned back, just in time to encounter incessant rains in the Massaroony. But I think the point is determined, that the *granitic* region is not the region of Orchideous, or indeed any other plants, which only grow there in much less vigour, variety, and plenty, than in the immediate vicinity of the coast.

"It is evident that colonization can never be attempted on this river. The first day's journal determines that. The only outlet for produce is the Yuruary, Corony, and Oronoque. But the cottons are of a fine staple and quality, though not unknown to me. They would be a most valuable article of commerce—but, alas! Dr. Hancock himself could never get them down those tremendous falls. The Cuyuny River is therefore a treasure that never can be opened; its resources are closed for ever.

"My expedition, it will be seen, occupied 20 days in ascending, and 14 in descending. In the Massaroony one day of descent equalled three of ascent. But I had the breeze right aft in the still waters, and with a very large sail, made as much way for several days against the current as I did in returning with it. My longitude of 300 miles west will therefore be found rather under than over the mark*—and my computed elevation, corrected by observations in the more direct course of the descent, will be found not excessive. The altitude of the mountains is a matter of pure conjecture, but it is founded on their character and appearance, which in all these rivers is so similar, that the debris, the sloping, and the perpendicular formation seem to embrace one general law of altitude, and are the same in all places, after passing the ridges of secondary hills.

* According to our maps, this distance would place the traveller to the westward of the River Carony, an affluent of the Orinoco, and in longitude 63° west of Greenwich, which would seem improbable.—Ed.

"The wind was always either E. or S.E., though the upper current of clouds were N. E., like the sea breeze. I found no peculiarities in the zoological department. The channel up is circuitous, in order to substitute numerous small rapids for single great falls. There are three portages for the corial itself, and six more for the baggage alone, whereas in Massaroony to a similar elevation there is only one portage, viz., at the mouth of the Caboory Creek.

"I should suppose a line drawn W. by N. would intersect the average course of the river to the Yuruary, beyond which the Spanish authorities give it a semicircular détour to the south.

"I can find no traces of any one having preceded me in the survey of the lower part of the river. The truth is, that few corials are equal to it—and the woodskins, or bark canoes of the Indians, are so inconvenient to sit in, and carry so small a cargo, that few would attempt the ascent in them. The coloured people below are ignorant of the passages after the first day—and the Indians themselves do not know how to manage a large craft up. My former habits gave me an advantage that succeeding adventurers will hardly possess, to whom I would state that beyond all other rivers the Cuyuny is the most difficult and dangerous of ascent, and should only be attempted with craft like mine, of the very finest description, and with a crew of the native Accaway Indians of the river itself, from the *upper* part, for I would not wish my greatest enemy such a crew as I was obliged to put off with, viz., the Caribisce below the falls."

IV.—*New Group of Islands in the Pacific.*

THE following extract from the remark book of H.M.S. Actæon, Captain Lord Edward Russell, while on the passage from Tahiti to Pitcairn's Island, notices the discovery of a group of islands in the Dangerous Archipelago, which does not appear in any of our charts:—

"*January* 3, 1837. While standing to the N.E. we discovered land, and at 3 P.M., being within three miles of the western island, bearing N.N.W., we made out three very low wooded islands with a heavy surf on the beach and no appearance of any anchorage: the northwesternmost island appeared to be a lagoon island with a reef extending about three-quarters of a mile from its N.W. and S.E. extremes. The names we affixed to them and their positions are respectively as follow:

"Bedford Island, N.W. point,	21° 18′ 30″ S.	136° 38′ W. of Gh.
Minto Island, centre . .	21 23 0	136 32 —
Melbourne Island, centre	21 28 30	136 27 —"

From the accompanying chart, made by Mr. Biddlecombe, master of H.M.S. Actæon, it appears that the islands extend

about 13 miles in a N.W. and S.E. direction, the centre island being about 5 miles in length. No traces of inhabitants are mentioned.

The positions were determined by means of three chronometers, "going extremely well," only 7 days from Tahiti, and 8 days afterwards the Actæon arrived at Pitcairn's Island; so that it may be presumed that there can be but little doubt as to the correct position of the group. The current off these islands, with a light westerly wind, set E.N.E. 7 miles in 24 hours; but it varied with the wind, and usually set to the westward. On January 9th, being 60 miles south of Pitcairn's Island, during a N.W. gale of wind, the current set 34 miles east in the 24 hours.*

The Actæon group is in the same parallel and about 60 miles to the westward of Hood's Island.

While at Tahiti Mr. Biddlecombe received some information respecting other islands in the Dangerous Archipelago, which do not appear in our charts, from Mr. Thomas Ebrill, master of the Tahitian merchant vessel "Amphitrite," which had for 23 years been sailing about this Archipelago; among others † was one he named after his vessel at that time.

Maria Island (1832), lat. 22° 5′ S. long. 136° W. of Gh., described as low and 4 miles in extent, and on which he landed in 1832.

This can be no other than the island stated to be discovered in December, 1835, by M. Denis, in lat. 21° 59′ S., long. 136° 12′ W. of Gh.‡ That island is described as 12 miles long. We are not informed of what part of the island the position is given, but if of the N.W. extremity its southern end would almost exactly coincide with the Maria Island of Mr. Ebrill in 1832, and as such therefore it is now inserted in our charts.

We may also note here that the position of

Lobos Islands is	24° 20′ N.	113° 10′ W. of Gh.
Guadalupe . . .	28 30 N.	118 10

as recently determined in the voyage of the Tuscan.§

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* The Society is indebted to Mr. J. W. Norie for communicating information of these islands, but the above extracts are from the remark book of H. M. S. Actæon, kindly lent by Captain Beaufort, R.N., Hydrographer to the Admiralty.

† Another group of three islands was reported to lie 45m. W. by N. ½ N. of Hood's Island, and doubtless was the same group that the Actæon afterwards discovered, and is described above.

‡ See Bulletin de la Sociéte, August, 1837, and Journal R. G. S., vol. vi., p. 441. It is also the same island as that named Wright's Lagoon Island, in the Nautical Magazine, Nov. 1837.

§ See Journal, vol. vii., pp. 222 and 228.

V.—*On the Dead Sea and some Positions in Syria.*

In the month of March, 1837, Mr. G. H. Moore and Mr. W. G. Beek, having made the necessary preparations and procured a good boat, left *Beïrut* in a small coasting vessel for Jaffa, their intention being to make a trigonometrical survey of the Dead Sea, to ascertain its depth, and to procure collections of all that could be of use to science. From Jaffa they conveyed their boat, stores, &c., to the Dead Sea, passing through Jerusalem and descending on Jericho; a work of great labour, considering that they had no assistance from the authorities, but rather the contrary. After surveying a great portion of the shores, these gentlemen were obliged to abandon their work, the guards and guides declaring they would not proceed. The width of the sea has been established beyond a doubt; soundings also have been taken showing great depth, in some parts upwards of 300 fathoms. The length of this sea is much less than is generally supposed. There appears also to be another remarkable feature in the level of the sea, as from several observations upon the temperature of boiling water, it appears to be considerably lower than the ocean. Mr. Moore has been down to Egypt to procure a firman from the Pasha to enable him to continue the survey, and has returned to Syria, but nothing is yet known of his success. Mr. Beek has been obliged to return to Europe on account of the influence of the climate on his health; but as soon as these two gentlemen meet in England, or when Mr. Moore has completed the work, should he be fortunate enough to succeed, an account of the whole will be laid before the public. In the mean time we are happy in being enabled to give a few results of observations for latitude made by these gentlemen on a former journey; that of Petra is, we believe, the first observation on record for that place:

Convent on Mount Sinai	28° 33½′ N.
Akaba Fort	29 32
Petra	30 19
Hebron	31 31½
Jerusalem	31 45¾
Jeraish	32 16½
Jaffa	32 4½

From some rough observations, Jeraish was found to be 2000 feet, and Jerusalem 2600 feet above the level of the Mediterranean.

VI.—*A Brief Narrative of the recent Voyage of H.M.S. Terror.*

"*To the Secretary of the Royal Geographical Society.*

"September 11, 1837.

"SIR,—As the expedition from which I have just returned originated with the Geographical Society, and, at its recommendation, was most liberally carried into effect by His Majesty's Government, I feel it incumbent on me to offer to the Society an outline of the principal events which occurred from the time of my quitting England in June, 1836, till my return to Lough Swilly on the night of Sunday the 3rd inst.

"In a statement of this description, it would be impossible to enter into the detail of all the extraordinary, and, I may say, unparalleled circumstances which have marked the course of the whole of our proceedings: such details, I trust, I may shortly be enabled to offer to the Society and to the public in a more complete form; but, in the mean time, it is due to those who took so warm an interest in the expedition to furnish them with an authentic narrative of the voyage, which must, however, necessarily be very brief, and will consist of extracts selected from my daily journal, as better calculated to convey a correct impression of the singular occurrences to which we were witnesses.

"June 23.—We took our departure from Papa Westra and steered across the Atlantic—the weather stormy. July 29.—We fell in with the ice, and on the following day we first saw the coast of Labrador, near Cape Chudleigh. Aug. 1.—Passed through Hudson's Straits, and on the 5th saw some of the Company's ships, apparently beset with ice, off the north Bluff. By keeping close in with the land we got ahead, and lost sight of them; and on the following day we were ourselves hampered. The ice was compact, and covered the horizon towards Hudson's Bay, as far as could be seen from the mast-head, while to the north-west it presented a favourable appearance; I had, therefore, no hesitation, in proceeding in that direction. Aug. 16.—We got a run of forty miles from Trinity Isles, yet did not get sight of Baffin Island till the 23rd, when we also saw Southampton Island to the south-west.

"Two days of westerly wind at this crisis would have enabled us to reach Repulse Bay; but easterly winds prevailed, and packed the whole body of ice in such a manner that all hope of retracing our steps, to pass to the southward of Southampton Island, and up Sir Thomas Roe's Welcome, was out of the question.

"On the 29th we were drifted by the ice to lat. 65° 50′ N., long. 82° 7′ W. This was our extreme north point, and here we were within forty miles of Winter Island, were the Hecla and Fury passed the winter of 1821-2. By dint of boring, the ship was worked to the southward towards Southampton Island, whither we were attracted by the flattering appearance of lanes of open water. Sept. 4.—We were only 136 miles from Repulse Bay, and two days of strong breeze would have led through Frozen Strait to our destination. During the next fortnight we continued drifting slowly to the westward, passing within three miles of Cape Comfort—a bluff headland, rising about 1000 feet above the sea. Sept. 20.—We were seriously nipped by the ice, so much so as to start some of the ship's fastenings. On the 22nd, being within

twenty-five miles of the Duke of York's Bay, we tried to cut through the ice, but found it impracticable, as it closed immediately. From this date the ship was no longer under our own guidance, but, being closely beset, was carried to and fro according to the wind and tide. Sept. 26.—We were drifted into lat. 65° 48′, long. 83° 40′, our extreme western point, and 90 miles from Repulse Bay. Sept. 27.—A rush of ice from the eastward lifted the ship's stern seven feet and a half out of the water—constant easterly winds. Oct. 9.—A clear channel in-shore as far as Cape Bylot, for the space of twelve hours, and again on the 27th; but we were so completely frozen up, we could not take advantage of it, although to effect so important an object the ice-saws, axes, and every other implement so liberally supplied by government, were put in requisition, and all the energies of both officers and crew were strained to the utmost, but in vain.

"Oct. 17.—The thermometer fell to 9° below Fahrenheit. In the beginning of November the ship was housed in, and every arrangement made for meeting the rigour of winter: snow walls were raised round the ship, and in this manner we drifted to and fro off the high land of Cape Comfort—at times carried so close to the rocks as to excite alarm for the safety of the ship.

"Dec. 21.—A furious gale from the westward drove us off shore 14 miles to the eastward of Cape Comfort, from which point the coast not before laid down in our charts was surveyed, as we drifted to the south-eastward for the distance of about 120 miles, as far as Sea-horse Point, the eastern extremity of Southampton Island. The general character of the coast barren hills and cliffs, varying from 750 to 1000 feet above the sea.

"On Christmas-day the first symptoms of scurvy showed themselves, which gradually extended itself to all hands. At one time twenty-five men were suffering severely from it, but eventually only three persons fell victims to this dreadful disease; viz., the gunner and two seamen. In the beginning of January, during a calm, our floe of ice split with a fearful crash,—and this was the commencement of a series of shocks, that nothing but the great strength of the mass of timber and iron employed in fortifying the ship could have withstood: as it was, the vessel strained in every direction. Feb. 18.—Early in the morning—thermometer at 33° below zero—a disruption of the ice took place, and waves of ice thirty feet high were rolled towards the ship, which complained much—the decks were separated—the beams raised off the shelf-pieces—lashings and shores used for supporters gave way—iron bolts partially drawn—and the whole frame of the ship trembled so violently as to throw some of the men down. Yet this was not our worst disaster. On the 15th of March, while drifting to the south-eastward, off a low point, since appropriately named 'Terror Point,' a tremendous rush of ice, from the north-west took the ship astern, and, although buried to the flukes of the anchor in a dock of ice, such was the pressure, that she was forced upon it, and, at the same time, thrown over to starboard—the sternpost was carried away, and the stern lifted seven feet out of the water. The same night, a second rush of ice tore up the remnants of our floe, and forced the ship on the ice, so that her forefoot was quite out

of water—her sunken stern was threatened by an overhanging wave of ice, full thirty feet high, but which, providentially, stopped as it touched the quarter of the ship—the water poured in through the stern-frame—and the ship creaked and strained in every direction: provisions were got on deck, the boats lowered, and every preparation made for the worst extremity; and, in the darkness and silence of the night, we calmly awaited the anticipated coming of another shock, which, to all human appearances, must have been the last.

"Heaven ordained it otherwise, and in this novel cradle of ice we were drifted, without further injury, to Sea-horse Point. The ice that bore us was ascertained to be 70 feet thick, and it was not until we had sawed through long lines of 25 feet thick, at a future day, that the ship was freed from this situation. The position of Sea-horse Point was determined to be 63° 43′ long., 80° 10′ W., variation 49° westerly; the lowest temperature was 53° below zero, when both mercury and brandy were frozen.

"On the 1st May the ship still on the ice, was drifted near Mill Island, thence to the southward of Nottingham Island, between it and Cape Wolstenholme, a perpendicular cliff of 1000 feet high, thence to the northward of Charles Island, which we reached on the 21st of June. The ice now showed symptoms of disruption, and we set all hands to work with a 35 foot ice-saw worked by shears, and on the 11th of July, having sawed to within three feet, the floe split in a fore and aft direction and liberated the larboard side; we immediately made sail on the ship, but found we could not extricate her from an iceberg between the fore and main chains: we again had recourse to saws and purchases, when the lump of ice still fast to the ship rose to the surface of the water, and threw the vessel on her beam ends, the water rushing in with frightful rapidity. All hands were instantly set to work again, and laboured day and night unremittingly at the fatiguing but indispensable operation of sawing, till, exhausted by their exertions, I was obliged to call them in from the ice for rest and refreshment. Not a quarter of an hour had elapsed from quitting the work when a sudden disruption of the ice took place, and the mass crashed with terrific violence against the ship's side, snapping, apparently without effort, the lashings and spars that had been placed, fearing this occurrence; and, but for the merciful interposition of Providence, all would inevitably have been crushed by the mass of ice on which they had just been labouring.

"As the ice separated the ship righted and drifted along. Finding it impossible to hang the old rudder, a spare one was fitted and sail made on the ship:—it was an anxious moment as we waited to see if she would answer her helm—and as she bore up before the wind, with her head towards England, a cheer of gratitude burst from all on board.

"I had cherished to the last moment the hope that the damages sustained might not be so great as to prevent my pushing for Wager Inlet by Sir Thomas Roe's Welcome, and there to beach the ship and repair damages, while some in boats carried into effect the object of our expedition; but when I found that she required two pumps constantly going to keep her free, that both outer and inner stern-posts were gone, the

keel seriously damaged, besides various other casualties, I felt it became my duty, however reluctantly, to make the best of our way homewards. Fortunately, the early part of our passage across the Atlantic was favourable, but subsequently the weather became boisterous, and the ship's leaks increased very much, so that we could barely keep her free with incessant pumping: to secure the ship also, we were obliged to frap her together with the stream chain cable.

"On the 6th of August we again passed through Hudson's Straits, and on the 3rd of September arrived in Lough Swilly, not having let go our anchor since June, 1836.

"To speculate on what might have been the result of this expedition, had I reached either Repulse Bay or Wager River, would now be idle, but I cannot resist the opportunity of recording my unaltered opinion, as to the practicability of the service, when once a party should have reached either of the before-mentioned starting places.

"The north-eastern shore of Southampton Island has been now surveyed, for the first time, by Lieutenant Owen Stanley, who has also made various views of the coast, and a chart showing the track of the ship; the remarkable positions in which the ship was placed among the ice have been admirably illustrated by Lieutenant Smyth, in a series of spirited and characteristic drawings.

"I cannot conclude this brief account without bearing testimony to the great assistance I have invariably received from Lieutenant Smyth, and all the officers and crew employed under my command in this expedition, to the cheerful obedience with which all orders were obeyed, and to the steadiness of behaviour evinced in circumstances of no common trial.—I have the honour to be, &c.

"George Back."

VII.—*On the North-Eastern Shore of Southampton Island.* By Captain Back, R.N. Communicated by Sir John Barrow, Bart., F.R.S.

The name of Southampton Island has become too familiar through modern voyages of discovery to the north, to require any description of its locality, and there are few persons who are not aware that Sir Edward Parry and Captain Lyon sailed on either coast, north and south, on their course to Repulse Bay. Long before their day, as far back as 1615, Bylot and Baffin also visited the same north-eastern part of the island under more favourable circumstances as regards the season than any of their successors; for early in June they were in Hudson's Straits, and had got past Cape Comfort before its termination; but being perplexed by the apparently circuitous and deceptive appearance of the land on each side of Frozen Strait, which was considered to be a bay, they bore away, and steering to the south, ran along the land to Sea-horse Point; between which and Nottingham Island they

remained till July 27th, without experiencing any, or at least many, of those icy difficulties, which seem to have increased so much of late. I believe that no chart was published of their voyage, and as Sir Edward Parry made the land somewhere about Cape Comfort in lat. 64° 50′ N., the intervening space of about 120 geographical miles comprehended between that Cape and Sea-horse Point, its eastern extremity, remained a blank on our maps, until the extraordinary situation of H. M. S. Terror, thrown on the surface of the ice, and forcibly carried by it along the whole line of coast, enabled me to fill it up.

Without reference to the details of the ship's movements and dangers, which, however interesting in themselves, are too numerous, and would occupy too much time to be inserted here, I shall commence in the order of our being driven close to the land near the south entrance of Frozen Strait, in lat. 65° 17′ N., long. 83° 41′ W., merely mentioning those passing events which are necessary for the perspicuity and clear comprehension of the following remarks.

The impracticability of forcing a passage into Repulse Bay by keeping as near as possible to Baffin's Island, being manifest by repeated failures, with considerable difficulty and much pressure from the heavy and closely-packed ice, by which we were beset, we gradually approached the coast of Southampton Island.

The frost smoke that allured us vanished as we drew near, and the dark lanes of water from which it originated closed firmly, to the utter impossibility of proceeding one yard farther. Left, therefore, to the influence of events, we were borne backwards and forwards, according to the eccentric movements of the ice, crowding sail when the least crack showed a probability of an opening, or with the aid of saws, axes, and ice anchors, warping a few paces, until the most closely packed ice finally arrested our progress, twelve miles from Cape Bylot, when only fifteen more would have ensured a safe wintering ground in Duke of York's Bay.

That portion of the coast it is unnecessary to describe, since ample justice has been done to it by more able pens than mine, but commencing from the sloping yet bold outline of Cape Bylot, and proceeding to the south-east, the land is high and irregular, apparently full of sinuosities and bays, bounded by abrupt precipices and shelving acclivities. These seem to offer shelter and a safe retreat from stress of weather and other accidents, but on a nearer inspection they are found to be open and exposed to the most dangerous winds from the north and east, owing to the prevalence of which, during the autumn of 1836, they were constantly blocked up with layers of ice. Provided, however, they were once clear, a vessel might find temporary security with any wind from the south.

Fifteen miles from Cape Bylot, the coast* is more broken into hill and valley, and rivulets and mountain torrents are seen worming their noisy way through the centre of the latter, until they fall into the sea, which at its margin is abundantly bordered by immense piles of ice. Four miles to the eastward the coast-line becomes more craggy, but retains the same general character as the former, and immediately turning to the south it forms Smyth's Harbour, one mile and a half long, and half a mile broad, sheltered from all winds except the north-north-east, which blows directly into it.

There seemed at one time to be a distant chance of our getting into this snug place, for a long and broad sheet of young ice was formed in-shore of us, and afforded a hope that nothing more formidable would impede the passage into the harbour, which, nevertheless, was so thoroughly blocked up, that the underlayers, forced there by external pressure, obstructed the descent of the lead when endeavouring to get soundings. Neither could the rise and fall of the tide be ascertained, though some approximation may be arrived at, from the marks or water-line on the rocks, which indicated from twelve to sixteen feet.

The western entrance is comparatively low, though by no means so in reality, since it soon rises into formidable elevations, intersected by abrupt ascents, which at particular places under the cliffs are thickly strewed with debris of the impending granitic rock, which has nearly the same mineralogical characters with that to the westward; but in the hand specimens brought home, the mica is so disposed in layers as to give a somewhat slaty structure to the mass. The harbour is surrounded by the same kind of granite, traversed by similar narrow ravines thickly covered with snow; but the point most deserving of notice was a fine imposing perpendicular cliff, six hundred and fifty feet high, from which there was the most beautiful echo imaginable; and its charms were so attractive in that monotonous solitude as to lead many from their ordinary occupations, for the mere novelty of hearing the stranger-like accents of their own softened voice.

Beyond these hills others rose to about eight hundred and fifty feet, backed again by a further inland range attaining to fully sixteen hundred feet.

The tracks of bears, foxes, and deer, were seen in the valleys, which produced a few miserably stunted willows, the occasional resort of a solitary brace of white partridges.

Eight miles from Smyth's Harbour is a wide open bay, where I landed. It was bounded by mountains of granite of exactly the same kind with that already described,† which abutted on the sea,

* Granite composed of a large proportion of rose-coloured felspar, grey quartz, and blackish mica in small scales, collected into patches.

† Most of the specimens are like the granite already spoken of—one called " iso-

and which were intersected by three valleys, two having nearly a due south direction, and the third a more westerly one. These valleys were formed of successive terraces of coarse gravel like gigantic steps, their regularity being only broken at unequal intervals, by protruding rocks like those around; they were the abode of a few Alpine hares, one of which was shot. The proximity of these intervening islands had visibly affected the quantity of gravelly deposit forming the terraces, since, in the narrowest, which was about three quarters of a mile broad, there was an increase of elevation amounting to several feet above the others. But, though the terraces rose with remarkable uniformity for upwards of two miles, they did not maintain the same regularity to the base of the further line of mountains, but, on the contrary, were suddenly bisected by numerous basins, having peculiar connecting ridges, with other terraces parallel to those first mentioned. On the higher ridges of the latter were a few solitary smooth rocks, worn so, perhaps, by attrition, which formed a marked contrast to the sharp and acute angles of the pointed rocks a little above them. A water-course ran through the centre of these different valleys; and near one was a circle of stones, evidently used a long time ago, for the purpose of extending an Esquimaux tent, denoting clearly that the place had formerly been frequented by those people. The mountains varied in height from fourteen to sixteen hundred feet, and though the ascent would be tedious from the depth of snow on them, yet, by winding up the ravines and along the slopes, the summits might be gained; and these being obtuse or rounded, afforded still greater facility for walking. One side was invariably precipitous, and the dip was nearly at right angles to the horizon. I looked in vain for any of those upright stones so plentifully set up as marks to cross the country, where the inhabitants are numerous, and which strike the eye of a stranger as very curious, when travelling through the interior of the continent, from the barren lands to the sea coast.

Again: the lower lands here were uncommonly sterile, hardly affording sustenance for the Alpine hare, while the ledges and summits above were clothed with grass, on which two rein-deer were feeding, while thinly scattered shrubs of stunted growth, and here and there a ground willow, relieved the eye from the monotonous and pallid glare of snow around.

East of this, the coast is sterile and forbidding, with a peculiarly wild and dark aspect, attributable in some measure to the abrupt steepness of the cliffs and rocks, where the snow cannot rest, and where the narrow defiles are more than usually gloomy.

The nearer rocks rise about 1000 feet, and receding from them three or four miles inland, the view is terminated by others of a

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lated rock in the valley" is a very fine-grained grey granite, having almost a slaty structure.

far greater elevation; the two most conspicuous among the number having rounded summits, visible at a considerable distance, and which particularly distinguish the headland, known by the name of Cape Comfort.*

From it the land trends away more to the south, and the tide and current, conjointly with the wind, produce a commotion here that nothing can withstand. On one occasion, when the ice in which the Terror was embedded, by some unaccountable convulsion was turned round, and exposed the shortest and weakest part of the floe to the action of the accidental lane of water along shore, we were taken within a short mile of the towering and perpendicular front of the Cape, which just there was rent into innumerable fissures, alternating with jagged and splintery projections of the most fearful description.

Though there was but little wind at the time, the ice was driven bodily against the rocks, and rising up in huge masses of many tons' weight, became reduced to fragments in an instant. Happily for us, after losing a few hundred yards of our floe, it drifted onward past the danger, and thus relieved me from further anxiety on that day. Stretching to the south-east beyond this, the coast partakes of a more mountainous character for upwards of 30 miles, having a slight curve, with apparent openings like harbours, but in fact destitute of the smallest shelter, desolate, and barren. Towards the limit of the distance, the outline of the mountains becomes more regular, with broader intervals and easier sloping valleys between them, until it is again altered by what, a mile or two off, wears all the semblance of a ridgy sand cliff, but which a closer investigation detects to be coarse gravel with imbedded rocks and stones of a yellow weather-worn appearance, but extremely hard to the hammer. The cliff is very high, and is seen from a great distance at sea.

Having been drifted within a mile of the shore, I went to it on snow shoes, not, however, without some scrambling and leaping to cross the heaped up ice, which from the immense pressure on it from the north, was thrown up and piled into the wildest chaos imaginable.

The line of coast at the place of landing trended N.W. and S.E., and rocks of sienite rose into disconnected hills from eight to twelve hundred feet high. Some of these hills struck from the interior to the beach in parallel ranges, in a direction of N.N.E. and S.S.W., and though a few bold perpendicular cliffs presented themselves, yet by far the greater part was separated by vertical fissures, having what I should term a jagged and excessively irregular surface.

* The specimens of granite from Cape Comfort are much weathered, and do not shew the rose-colour in the felspar; in other respects, they resemble those from Smyth's Harbour.

The general colour was a reddish yellow, with almost parallel and horizontal leaves or stripes of blackish green, differing nevertheless in this particular, according to which of the two prevailed. Some indeed partook of a dullish green. Behind these ranges, and divided only by valleys from a quarter to a mile and a half broad, were other hills slanting towards the former, and more rounded in general form, though equally broken in miniature.

They looked like trap formations, and had also narrow valleys running far into the interior. Farther to the westward, in a direction towards the ridge cliff, the outline presented a more even aspect, with an extensive valley and a river running through it. The same kind of terraces were observable as before, with this difference, that their surfaces were all parallel to the horizon, while the precipitous parts had nearly the same inclination, and this character extended to the ridge cliff, which with similar arrangements at different altitudes was almost tabulated on the top.

To the east, on the contrary, there was not much variation, except that the waters of a lake emptied themselves over a picturesque ledge of rocks into the extreme end of Stanley Harbour, which was nearly of similar dimensions, and equally, if not more, exposed to the prevailing winds than the first one described. The country then got more rugged, and produced a brawling and rapid river 200 yards wide at the mouth, bordering on which the hills grew steeper, and ultimately ended in Cape Fisher, 750 feet high. In traversing the different valleys, and especially that which I first ascended, it was impossible not to remark the progressive terraces, and the diminution of their flat or upper surfaces as I drew near to the highest point of elevation; the same features being equally conspicuous in all. The entire face of the country (as far as I could ascertain) consisted of rounded stones of sienitic granite, more resembling coarse shingle than anything else, though far apart from each other; I sometimes observed a few loose slabs of limestone,* the first seen being at an elevation of 400 feet above the level of the sea. I could not discover any approximation to an equality of level in the terraces separated by the rocks, but it was scarcely possible to avoid leaning to the opinion that they had been subjected to inundation at one time or other.

There was a want of vegetation unusual even in these regions, and a more decidedly sterile scene, in the fullest acceptation of the phrase, could not well be imagined. Nor was it merely local, for some rather long excursions were made inland in search of animals, without success; and in the course of the journeys, only a few scattered patches of moss and short grass were seen, and not a living thing of any description.

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* (Compact magnesian limestone—mountain limestone?) This limestone is evidently of the same kind with some rolled pieces found on the ice, one of which contains corallines.

The country got more mountainous as the parties advanced, and though very desirous of reaching the summit of the most elevated point, yet finding always a fresh hill rising before them, the design was abandoned, and they returned wearied and disappointed to the ship.

For fourteen miles beyond Cape Fisher, in a S.E. by S. direction, the main appearances continue unaltered: the line of coast indeed is more broken and tortuous, and one bay was passed which looked favourable enough, but in all probability differed little from the others. Thence, however, eighteen miles further, there is a decided change; for the hills gradually decrease in size as they turn away south, and becoming ultimately low and sloping, turned a little easterly until they are lost altogether at Point M'Murdo, which is the western entrance to an extensive bay, inlet, or strait; but which, could not be ascertained, though from the strong set of the current into it, there seems some probability of its being connected with Evans' Inlet, on the east side of the island. The low land stretching from Point M'Murdo to the S.S.W. was lost sight of in clear weather, and high hills made out about 20 miles due south in the opening. The closeness of the ice, however, prevented the ship being carried into it; and it was hereabouts that we experienced those successive rushes of the ice much more frequently than to the westward.

The breadth of the opening as far as Point M'Lure, which forms the eastern entrance, is about 14 miles, having Gore Island, near the latter, and some more land, possibly another island, due west of it. Far from being low, Gore Island consists of high rocks, and on the western side is a huge bluff, which from a few miles' distance has an imposing appearance. The coast too from Point M'Lure resumes its mountainous outline, and though more even and accessible than some already described, there are two dome-like summits that distinguish it from every other part. Mount Minto, which is the highest, attains to upwards of 1000 feet, and from the eastward has a conical shape. Running out from the latter, or separated by a narrow channel, is another line of low hills forming Terror Point, so named from its being the place where the sternpost was carried away, and the ship sustained the greatest damage. This low coast extends about 14 miles to Point Saunders, and then diverging to the south-west, is lost in the continuation of the mountain range from Mount Minto.

Twelve miles beyond the last point, and close to Sir James Gordon's Bay, the high land terminates, and disappears altogether in two small islands; immediately to the south-east of which is Sea-horse Point, the eastern limit of Southampton Island.

LIST OF GEOGRAPHICAL WORKS RECENTLY PUBLISHED.

EUROPE.

BRITISH ISLES—The Physical and Political Geography of Great Britain and Ireland, published by the Society for the Diffusion of Useful Knowledge. Nos. 1–9. 1837.

„ Tour through England, Scotland, and Ireland, the Channel Islands, and the Isle of Man, by Sir George Head. 8vo.

„ Excursions through the Highlands and Isles of Scotland in 1835–6, by the Rev. C. L. Smith, post 8vo.

„ Guide through Scotland, by W. Anderson. 12mo.

„ Pedestrian Tour through England and Wales. 2 vols. 8vo.

„ Tour through the Midland Counties of Ireland in 1836, by the Hon. and Rev. B. W. Noel, post 8vo.

„ Highland Rambles, by Sir T. D. Lauder. 2 vols. 8vo.

„ Anteckinngar i anledning, af en resa till England, &c. by Carl af Forsell. Stockholm.

„ Aus dem Tagebuch, eines in Grossbritannien reisenden Ungarn. Pesth. 12mo.

Iceland—Voyage en Islande et au Groënland en 1835–6, sur la corvette la Recherche, publié sous la direction de M. Paul Gaimard. 8vo. 4 livraisons en vente.

„ Lettres sur l'Islande, par X. Marmier. 8vo.

Denmark—Reisebilder aus Dänemark und Schweden, von A. von Treskow. 8vo.

Norway—Journal of a Residence in Norway, in 1834-5-6, by Samuel Laing, Esq. 8vo.

Belgium—Reisebreife aus Belgien, von Dr. A. Loebell. 8vo.

„ Seven Weeks in Belgium, Switzerland, Lombardy, &c., by John Roby.

Switzerland—Reise durch die Schweiz, das Sudl. Frankreich, Italien, Tyrol, und Baiern. Tageblätter von Sommer und Herbst, 1835. 1ster band, 8vo.

„ Ascent to the Summit of Mont Blanc in 1834, by Martin Barry, M.D. 8vo. 1836.

„ Blicke auf die östl. Alpen und Land um die Nord-Kuste d. Adriat. Meeres, von Baron von Canstein. 8vo.

Germany—A Hand-Book for Travellers in Northern Germany. 8vo. Murray. 1836.

„ A Hand-Book for Travellers in Southern Germany. 1 vol. 8vo. Murray. 1837.

„ Europa und seine Bewohner, von Hoffmann. 3rd vol. 8vo.

„ Das Königreich Böhmen, Statistisch-topographisch dargestellt. 5ter Bd. 8vo., von J. G. Sommer.

„ Alpes et Danube, par Baron d'Haussez. 2 vols. 8vo.

„ Voyage en Hongrie, en Transylvanie, en Crimée, et à Constantinople; dans l'Asie Mineure, en Syrie, et en Egypte, par le Duc de Raguse. vols. 1 & 2.

„ Austria and the Austrians. 2 vols. 8vo.

Russia—Journal of a Tour to Moscow in 1836, by the Rev. R. B. Paul. 12mo. 1836.
„ An Account of the Russian Ports in the Black Sea, pamphl. 8vo.
Greece—Erinnerungen aus Griechenland, von Prell. 8vo.
„ Athens and Sparta, by J. A. St. John.
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